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BREAST FEEDING COMES OF AGE

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In this paper I give a brief history of breast feeding and discuss some of its disputed features, in the hope of "rescuing breast feeding from its present somewhat neglected state" [1] by showing that the literature establishes it as a sound scientific procedure which has at last come of age.

The earlier contributions to the literature on breast feeding were largely hortatory, scolding physicians and mothers alike for their readiness to wean the infants and praising breast feeding.[2] This almost religious fervor is understandable to the physician who remembers when dirty milk was the rule rather than the exception and when breast-fed babies in New York tenements had better chances for life and health than their bottle-fed contemporaries on Fifth Avenue.[2b] Not until 1930 was a writer willing to state that he considered artificial feeding as good as natural.[3]

In spite of this preaching, until 1919 breast feeding was looked on by the average physician as a providential occurrence. If the mother could not nurse her infant so-called "scientific" artificial feeding was begun, and the sooner the better. Like the well known comment on the weather, everybody talked about breast feeding but no one did anything about it. In 1919, however, Sedgwick started a movement that brought the possibility as well as the advantages of breast feeding to the attention of the mother of every baby born in Minneapolis from January through May of that year.[4] Featuring manual expression, he taught medical students, physicians and mothers that almost every mother can nurse her baby, provided she and her physician wish it and learn the technic. But there were many who claimed that this was possible only with sturdy women not far removed from the farm and that sophisticated Eastern city women would never be able to give similar high percentages of breast feeding.

A convincing reply was furnished to these objectors when a similar demonstration was put on in Nassau County, a suburban section just outside the city of New York, by the state department of health in 1925 and 1926,[5] with results that were almost identical. Even better figures were obtained in demonstrations that followed in smaller cities throughout the state.[6]

These various demonstrations proved convincingly that "almost any mother who wanted to, and whose doctor understood a simple technic, could breast feed her baby as long as she and her doctor desired," [7] with a distinct reduction of mortality and morbidity percentages,[2b] enhanced immunity to gastrointestinal and respiratory diseases,[8] and the emotional benefits claimed by the psychologists for mother and baby alike.[9]

Whereas all that physicians knew about artificial feeding had followed the studies of Biedert in 1869,[10] Fritz Talbot's work on human milk in 1919 [11] was another serious study. This showed the fallacy of condemning mother's milk on the strength of a single specimen tested with Holt's cream gage and lactometer.[2b] And in 1923 Turner, a pediatrician who had been a farm boy, called attention to the similarity of milk formation in two mammalian mothers, the human and the bovine, and drew interesting conclusions on increasing milk production in mothers by methods similar to those in use in the dairy.[12]

Various opinions whether colostrum is laxative, nutritious and germicidal in the human being as it is in the calf [13] are held by various authors.[14] Although earlier

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1. Report of Committee on Mother's Milk Bureaus, Pediatrics **1**: 109 (Jan.) 1948.

2. (*a*) Walker, J.: Is Nursing by the Mother to Be Encouraged? Arch. Pediat. **2**: 1 (Jan.) 1885, in Arch. Pediat. **62**: 78 (Feb.)* 1945. (*b*) Holt, L. E.: Diseases of Infancy and Childhood, ed. 4, New York, D. Appleton-Century Company, Inc., 1908, and personal communication to author. (*c*) Abt, I. A.: Facts and Fallacies About Breast Feeding, St. Paul M. J. (April) 1915. (*d*) Brennemann, J.: Practice of Pediatrics, Hagerstown, Md., W. F. Prior Company, Inc., 1945, chap. 25, vol. 1. (*e*) Infant Feeding: Maternal and Artificial, Butler, Ind., H. R. Farnham, 1915, p. 15. (*f*) Gruler, C. G.: Breast Feeding, Proc. Interstate Postgrad. M. A. North America, 1943, p. 135. (*g*) Gruler, C. G., and Caldwell, F. C.: Influence of Menstruation on Breast Feeding, Am. J. Dis. Child. **9**: 374 (May)* 1915. (*h*) Guthrie, S. K.: Breast Feeding, Chin. J. **65**: 205 (May) 1936.

3. Glazier, M. M.: Comparing the Breast and Bottle Fed Infants, New England J. Med. **203**: 626 (Sept. 25) 1930.

4. Sedgwick, J. P.: Preliminary Report of Breast Feeding in Minneapolis, Am. J. Dis. Child. **21**: 455 (May) 1921. Sedgwick, J. P., and Fleischner, E. C.: Breast Feeding in the Reduction of Infant Mortality, Am. J. Pub. Health **11**: 133 (Nov.) 1921.

5. (*a*) Nurses' Manual for Breast Feeding in Nassau County, New York, Division of Maternal Information and Child Hygiene of New York State Department of Health, Albany, N. Y., 1924. Richardson, F. H.: Progress of Breast Feeding in New York State, J. A. M. A. **89**: 1487 (Oct. 29) 1927; Breast Feeding Demonstrations and the Physician, ibid. **87**: 1977 (Dec. 11) 1926; Universalizing Breast Feeding in a Community, ibid. **85**: 668 (Aug. 9) 1925; (*b*) Annual Report of the Division of Maternal Information and Child Hygiene, New York State Department of Health 1925-1926, Albany, New York, State Printers, 1927, pp. 66-71 and p. 76.

6. Wakeman, R. R.: Daughter Demonstration in Hornell, in personal communication to the author.

7. Richardson, F. H.: Simplifying Motherhood (Footnote 5b) New York, G. P. Putnam's Sons, 1925.

8. (*a*) Gruler, C. G.: A Baby's Best Chance, Woman's H. C. **63**: 20 (Oct.) 1936; Study of Seasonal Morbidity and Mortality of 20,000 Breast and Artificially Fed Infants, J. Pediat. **6**: 6 (June) 1935; Breast and Artificial Feeding, J. A. M. A. **102**: 735 (Sept. 5) 1934; Breast and Artificially Fed Infants, ibid. **104**: 1986 (June 1) 1935; (*b*) Influence of Breast and Artificial Feeding on Infantile Eczema, J. Pediat. **9**: 223 (Aug.) 1936.

9. Childers, A. T., and Hamil, B. M.: Emotional Problems in Children as Related to the Duration of Breast Feeding, Am. J. Orthopsychiat. **2**: 134, 1932. Stone, S., and Bakwin, H.: Breast Feeding, J. Pediat. **33**: 660 (Nov.) 1948.

10. Strong, R. A.: The Renaissance of Breast Feeding, Internat. M. Digest **5**: 912 (Nov.) 1924; The Decline of Breast Feeding, ibid. **24**: 123, 1939.

11. Talbot, F.: The Analysis of Human Milk, J. A. M. A. **73**: 662 (Aug. 30) 1919.

12. Turner, M. L.: Some Observations from Nature, Tr. Sect. Dis. Child., A. M. A., 1923, p. 63.

13. Smith, T., and Little, R. B.: The Significance of Colostrum to the New-Born Calf, J. Exper. Med. **30**: 181, 1922.

14. (*a*) Marriott, W. McK.: Infant Nutrition, St. Louis, C. V. Mosby Company, 1930. (*b*) Smith, C. A.: The Physiology of the Newborn Infant, Springfield, Ill., Charles C Thomas, Publisher, 1945. Abt.[4c] Brennemann.[5d]

studies were limited to estimation of percentages of protein, carbohydrate and fat, interest later widened to include mineral content as well as vitamin potency.[15]

A careful study of human milk flow by Icie Macy and others to find out whether nervous, chemical or glandular agents operate to start the flow of milk led to the following conclusions: all are helpful to the physician who is trying to increase milk production:

Complete stripping is essential to maximum production.

Heavy work influences the amount and kind of milk unfavorably.

Nervous factors depress, and severe shock may completely suppress, the flow of milk.

Highstrung women are not good producers.

Volume varies significantly at different times.

Quantity is responsive to demand; it is doubled or even trebled by pumping.

It is impossible to distinguish between the rate of milk formation and the outpouring of previously formed constituents of milk.

Production increases till the sixth week or later, then the high level is continued for many weeks.[16]

Present day trends in infant feeding were well summarized by Milton Senn.[17]

Knowledge of the structure of the lactating breast is helpful in understanding its function [18] and the influence and effect of suckling on the development of the infant's mouth.[19] One study of 900 cases showed that 87 per cent of mothers attempting to nurse their infants will have an adequate supply on the fifth postpartum day for part or full time nursing and about 70 per cent will achieve full time nursing, varying with their age and parity and whether the baby is nursed from both or alternate breasts.[20]

Another study noted how suckling rhythm changes from regular, steady, uninterrupted cadence when breasts are full to irregular spurts later.[21] Others described the mother's subjective symptoms, as of "the milk coming in," prickling, tension, tickling, itching [22] and what English observers call "the draught." [23] The effect of fatigue and of insufficient rest and sleep in decreasing production have frequently been mentioned.[23]

Aldrich noted four reflexes concerned with the actual getting of food—rooting, sucking, swallowing and satiety. He described the way that the nursling turns his head toward the breast when he feels it against his cheek or smells the milk.[24] Other observers have confirmed this behavior.[25]

15. Macy, I. G., and others: Human Milk Studies, Am. J. Dis. Child. 70: 135 (Sept.) 1945. Knott, E. M., and others: Is Breast Milk Adequate in Meeting Vitamin Requirements of Children? J. Pediat. 42: 49 (Jan.) 1943.

16. Macy, I., and others: Human Milk Flow, Am. J. Dis. Child. 39: 1186 (June) 1930.

17. Senn, M. F. E.: Trends in Infant Feeding, Wisconsin M. J. 47: 195 (Feb.) 1948.

18. (a) Within, M.: Importance of Preliminary Milk Expression and Bilateral Breast Feeding, Arch. Pediat. 57: 477 (Aug.) 1940; (b) Newer Concepts in Breast Feeding, Practitioner 152: 384 (June) 1944.

19. (a) Robin, P.: Physiology of Sucking at the Breast, Bull. Soc. pédiat. de Paris 27: 34 (Jan.) 1929. (b) Des Fosses, P.: Nursing at the Breast, Presse méd. 45: 601 (April 17) 1937.

20. Stewart, H. L., and Pratt, J. P.: Influence of Suckling Stimulus on Lactation, West. J. Surg. 49: 98 (Feb.) 1941.

21. Hofmann, E., and Peiper, A.: Roentgenography of the Process of Suckling, Klin. Wchnschr. 14: 1723 (Nov. 30) 1935.

22. Naish, P. C.: Some Problems of Breast Feeding, Practitioner 152: 384 (June) 1944.

23. Richardson, F. H.: Critical Periods in Breast Feeding, Hygeia, 20: 224 (March) 1942; The Nursing Mother: A Study in Lactation, New York State J. Med. 22: 161 (April) 1922.

24. Aldrich, C. A.: Ancient Precursors in a Scientific Age: Feeding Aspects, Am. J. Dis. Child. 64: 714 (Oct.) 1942; Advisability of Breast Feeding, J. A. M. A. 128: 915 (Dec. 6) 1947.

25. (a) Wyckoff, C. W.: Advances in Infant Feeding, Clinics 5: 589 (Oct.) 1946. (b) Cathie, I. A. B.: Breast Feeding in Erythroblastosis Foetalis, Brit. M. J. 2: 630 (Oct. 25) 1947. Bowley, C. C., and Dunsford, I.: Erythroblastosis and Breast Feeding, ibid. 2: 1007 (Dec. 20) 1947. (c) Norval, M. A.: Suckling Response of Newly Born Babies at Breast, Am. J. Dis. Child. 72: 41 (Jan.) 1946. Blanton, M. G.: Behavior of the Human Infant During First Thirty Days of Life, Psychol. Rev. 24: 456, 1917. Naish.[23]

THE TECHNIC OF BREAST FEEDING

The foregoing survey of the voluminous literature on breast feeding and the structure, function and hygiene of the lactating breast of the nursing mother show a healthy difference of opinion on many points. Further study of the literature reveals sharply differing opinions on almost every one of the cardinal points concerning the actual technic of breast feeding. Although I shall make an honest attempt to present both sides in the argument concerning each of these cardinal points, I shall indicate plainly my own preference in each instance and justify my own technic. I believe that every man who wishes to make breast feeding a useful tool should similarly evolve a method of his own. Not until this becomes fairly common practice can it honestly be claimed that breast feeding has really come of age.

Manual Expression.—The first of these cardinal points in breast feeding is manual expression, which in the human being is analogous to milking, with the forefinger and thumb employed instead of the whole hand of the milker. Simple as this procedure is, and most valuable for reasons to be discussed, manual expression is seldom practiced, to judge by the keen interest manifested whenever it is demonstrated before a group of physicians, and their evident surprise when they see jets of milk spurting 6 feet (183 cm.) or more.

The technic of manual expression has been explained by various writers in many terms, some of which make it seem difficult and complicated.[26] It is shown to be simple by the following description:

> The proper way to empty a breast is to "milk" it. . . . Grasp the breast just back of the areola between the thumb and the first finger of the opposite hand. Close the thumb and finger on the (portion of the) breast tissue (lying between), drawing them forward with a slight milking motion. . . . At first the milk may come in drops; but after a few manipulations a spurting stream may and should be obtained. This has a tremendous psychologic effect on the mother and her relatives.[27]

The technic can be mastered by any physician and taught to any mother in a matter of minutes.

(*a*) Manual expression is useful for making sure of the complete emptying, or "stripping," of the breast that most authorities agree is essential to continued optimum production. (*b*) It is also valuable as a means of determining whether and when the breast has been completely emptied, so as to save the baby from useless effort and the mother's nipples from needless and painful trauma. (*c*) Two physicians stated that they instruct expectant mothers to empty their breasts of colostrum by this method at frequent intervals three months ante partum, believing that this promotes breast feeding.[28] (*d*) Manual expression has a tremendous psychologic effect on mothers who doubt their ability to nurse.

The old-fashioned breast pump is still advocated by some writers, though there is general disapproval of its use. The easiest form of mechanical expression is by means of the Abt electric breast pump.[26d] Water-power breast pumps, depending on a water suction apparatus like that used for cleaning pipets in the

26. (*a*) Moore, C. U.: Nutrition of Mother and Child, Philadelphia, J. B. Lippincott Company, 1923, p. 96. (*b*) Waller, H.: Early Failure of Breast Feeding, Arch. Dis. Child. 21: 1 (March) 1946. (*c*) Davis, H.: Human Milk Studies. XXI: Simple Technic for Manual Expression of Mother's Milk, Am. J. Dis. Child. 70: 148 (Sept.) 1945. (*d*) Tarr, E. M.: Development and Reestablishment of Breast Milk by Use of Dr. Abt's Breast Pump, California & West. Med. 20: 128 (June) 1924. (*e*) Spock, B.: Baby and Child Care, ed. 1, New York, Pocket Books, Inc., 1946, p. 47. (*f*) Marriott.[26b]

27. Richardson, F. H.: Breast Feeding, New York State J. Med. 25: 263 (April 27) 1925.

28. Within.[27] Waller.[26b]

laboratory, may be improvised and are satisfactory.[29] Hot applications or massage are as ridiculous and ineffective as they would be if applied to a cow's udder.[12]

Complementary Feeding.—Now considered an almost indispensable feature of successful breast feeding, complementary feeding greatly lessens the worry and mental strain of every mother when she fears that her supply of breast milk is insufficient for the infant and that her baby will starve if she does not have some help in nourishing him.

Although some authors still make the distinction between complete breast feeding and so-called "mixed feeding," most of the enthusiastic proponents of breast feeding would feel badly handicapped in caring for mother and child if they could not depend in time of trouble on complementary feeding.[30] ("Supplementary feeding," alternating breast and bottle at successive feedings, is generally discredited, because such infrequent stimulation of the breasts would mean speedy weaning of the infant for most mothers.)

Length of Time at the Breast.—Perhaps one of the most vigorously contested points in the whole technic of breast feeding is the length of time the infant should remain at the breast. It is so closely related to the possibility of overfeeding that the two may be considered together.

Overfeeding.—The older writers made much of overfeeding as a common cause of trouble. One modern writer, Charles Hendee Smith, made an equally emphatic statement:

"The baby gets about 75 per cent of his nursing in the first two to four minutes. Six to eight minutes is usually adequate. If the supply is overabundant, three to five minutes. One of my patients got all he needed in forty seconds!"[31] This writer stated his belief that the overfed baby gains too much, has too many loose green or yellow stools with curds, cries after feeding, has tense skin and contracts eczema.[32] Another allowed only seven minutes.[33] Still another permits feeding for fifteen minutes, believing that after that time the child swallows air, which causes colic, crying and sleeplessness. "Their gums become painful, raw, inflamed and angry looking."[18] (I have still to see such results of overlong feeding![34])

One author stated that the time at the breast should vary with the baby's nursing vigor and degree of wakefulness.[24] My own position is strongly against any arbitrary time limitations, which I believe to be the cause of many unnecessary weanings, especially the time-honored but evil hospital limit of twenty minutes.[24] I have never seen anyone with patience and perseverence enough to overfeed a baby.

Amount of Breast Milk Necessary.—A baby needs to drink an amount of milk that equals one seventh to one sixth of his body weight per day.[35] Twenty-five calories and 1½ to 2 ounces (44 to 59 cc.) of fluid per pound (0.5 Kg.) of body weight are needed for the first week, while 45 calories and 2 to 2½ ounces (59 to 74 cc.) of fluid per pound are necessary throughout the first year.[36]

Weighing Before and After Feeding.—It would seem logical to weigh the infant before and after feeding in order to determine how much breast milk he is getting if it were necessary to know this, as some authorities believe that it is. Smith and Merritt have even done what they call "fractional weighings," by which they mean weighing an infant every two minutes throughout an entire feeding. They have thus accumulated valuable data on the rate of secretion of breast milk.[37]

Although many authorities place much dependence on this method of determining the amount of food taken by the infant, others believe that this may be misleading unless the intake is measured for an entire twenty-four hours. Brennemann advised that weighing before and after feeding may be used, but he counsels that it "should be discontinued after it is once established that the baby is getting enough." He adds that "too much weighing of a thriving baby is a meddlesome, unscientific procedure" and that "mothers have emotions . . . that have a direct influence upon the amount of milk secreted when the scale records a smaller amount of milk secreted."[24] Another author devised a mathematical formula as a substitute for before and after weighing.[38]

I agree with Brennemann to such an extent that I am strongly against relying on such an artificial and unreliable method of determining whether and when a baby has had enough. I rely on the baby himself to indicate to me and his mother when he has had enough.

One or Both Breasts at a Nursing.—Although many hospitals and a great many physicians who are not especially successful with breast feeding favor allowing but one breast at a feeding, experimental evidence is greatly in favor of two-breast feedings.[39] Another observer has noted that "When one (breast) is being stimulated, the other is also, and if not emptied there will be some absorption, and usually the milk diminishes. The dairyman would not think of milking one half of the cow's udder at one time and half at another."[12]

It is my own firm conviction that the standardized hospital limitation to one breast at a nursing, and that other equally orthodox but equally unnatural limitation to twenty minutes at a nursing, are responsible for a vast number of entirely unnecessary weanings.

Posture During Nursing.—Although many mothers nurse their infants while lying down, most writers advocate the 45 degree angle naturally assumed by a baby in his mother's arms, with an occasional shifting to her shoulder for 'burping." Smith and LeWald's roentgenologic studies showed an immense air bubble in a baby nursing in the horizontal position, which disappeared immediately when he was held upright. The crying and evident discomfort and pain disappeared at the same time. They concluded: "The erect posture favors eructation of (swallowed) air; the horizontal posture prevents (such eructation)."[40]

29. Caldwell, F. C.: An Effective Breast Pump, Am. J. Dis. Child. **9**: 381 (May) 1915. Marriott.[15a]

30. Dwyer, H. L., and Neff, F. C.: Complemental Feeding in the Newborn Infant, J. A. M. A. **99**: 463 (Aug. 6) 1932.

31. Smith, C. H.: Diet of Young Infants, New York State J. Med. **41**: 2395 (Dec. 15) 1941.

32. Richardson, E. H.: Diet of the Infant, Maine M. J. **23**: 89 (May) 1937.

33. Barber, W. W.: Newer Aspects of Infant Feeding, Rocky Mountain M. J. **35**: 537 (July) 1938.

34. Richardson, F. H.: Lactancia para Toda criatura, read before the Fifth Pan American Congress of Children, Havana, December 1927.

35. Taylor, R.: Care of the New Born Infant, Journal-Lancet **52**: 661 (Nov. 1) 1932. Brennemann.[24]

36. Tallerman, K. H.: Common Difficulties in Breast Fed Infants, Practitioner **154**: 343 (June) 1945.

37. Smith, C. H., and Merritt, K. K.: Rate of Secretion of Breast Milk, Am. J. Dis. Child. **24**: 413 (Nov.) 1922.

38. Antonov, A. A.: A Formula for Determining the Amount of Maternal Milk Which the Nursling Is Lacking, Arch. de méd. d. enf. **29**: 562 (Aug.) 1936.

39. Within.[35] Stewart and Pratt.[29]

40. Smith, C. H., and LeWald, L. T.: Influence of Posture on Digestion of Infants, Am. J. Dis. Child **9**: 261 (April) 1915.

Others have advocated keeping the infant as upright as possible during nursing [38] (so-called "orthostatic sucking," [19a] as in savages, ancient sculpture and among all other mammals. [19b]).

Gas.—All the older textbooks, and many a physician and mother today, take for granted that indigestion in babies is commonly caused by fermentation and the "gas" that results. Although it is difficult to conceive that fermentation could create enough gas to cause the distress that so many infants manifest shortly after eating, this idea persists. Smith and LeWald, however, definitely disproved this by roentgenologic evidence, and Smith stated: "Swallowed air accounts for gas in the large majority of cases. Air is constantly present in the larynx; and some is forced down with the food and with saliva or nasal or bronchial mucus between feedings." [40]

McQueen Salley offered an ingenious explanation for this immediate bubble that could not come from fermentation. He said flatly: "I do not believe the nursing baby ever swallowed air. I do know that the action of dilute hydrochloric acid on certain liquids does produce gas (immediately), and that is what happens with the baby." [41] Farmers who have treated the colic of so-called "cribbing" or "air-swallowing" horses by massaging their bellies with a broomstick may take issue with what Dr. Salley says about babies!

Colic.—Is colic a clinical entity? Or is the "six weeks colic" or the "three months colic" insisted on by the old ladies merely a myth? Many of the older writers and some of the new ones have insisted on its existence, some of them citing "enterospasm" [24] and "hypertonic" infants.[42] Rosamund [43] has insisted that "hunger and colic are synonymous." My own experience convinces me that so-called "colic pains" are usually due to hunger or to overdistention with swallowed air. This does not take into consideration the colicky pains of intussusception, pyloric stenosis, pylorospasm, appendicitis or peritonitis, which have other accompanying symptoms confirming the diagnosis. If eructation or the passage of a stool, followed by the chance to take more food, does not make the "colic" disappear, then these more serious organic causes should be considered.

Prelacteal Feeding.—Prelacteal feeding is an attempt to circumvent nature's plan of having the baby lose weight (sometimes as much as ½ pound, 226 Gm., or more) during the first few days of life by offering him a sugar solution or a substitute formula until lactation is fully established. Brennemann asked whether physicians were "to accept . . . an initial three-day period of semistarvation with a 10 per cent loss in weight or to proceed at once to feed the newborn infant." He stated that he gave prelacteal feeding as a routine.[24] But he said elsewhere: "No other food should be given at this time except water." [39]

While many physicians see no objection to prelacteal feeding, far more are strongly opposed to it.[44] Grulee, finding that only 48 per cent of the babies at one hospital were still breast fed at the end of the lying-in period, ordered that nothing but water be given them in addition to breast milk. "At the end of six or eight months," he stated, "these figures were changed to approximately 90 per cent." [21] In my practice I forbid everything but water until lactation begins.

Feeding Intervals.—Shall the infant be fed at the familiar, regular three or four hour intervals, or shall one advise the "demand" or "self demand" regimen on which the baby is fed whenever he cries? Spock has called it "the experiment of going back to Nature." [20a] A Detroit group, the "Cornelian Corner," has urged that the infant be given "opportunity to nurse whenever . . . hungry or anxious," for "relief of tensions so incident to feeding, toilet training and child discipline." [45]

The majority of physicians and mothers still prefer regular three or four hour feeding intervals.[22] Since the baby usually discontinues his 10 p. m. feeding in a few weeks, if not awakened for it, and the remaining night feeding around the end of the second month, the same result is obtained by either method. A regular schedule not too rigorously followed is probably the most sensible course to adopt, avoiding both unbending punctuality and the *laissez faire* self demand.

Contraindications.—Contraindications for breast feeding are not nearly as numerous as they were formerly. The following list is sensible:

Allergy to mother's milk.
Failure to supply one half of caloric needs, with failure to gain.
Fissured nipples with bleeding bases, or mastitis.
Menstruation soon after onset of lactation (?).
Pregnancy.
Acute illness of mother.
Painful breasts.
Rh-positive infant of Rh-negative mother. (However, experimental work seems to prove this milk harmless.[35b])
Nursing in maternal tuberculosis "may demineralize lesions which are otherwise slight or clinically cured." [46]

Infantile eczema [6b] and changes in color of stools are no longer considered cause for weaning. (Other authors list some of the ridiculous excuses given by mothers for stopping nursing.)

To prevent trouble with nipples, they may be pulled out and held so, if inverted; they may be toughened with alcohol during two or three months ante partum, as advocated by most writers, though one expressed a preference for use of wool fat rather than alcohol.[36] (Another writer advocated examining girl babies for inverted nipples and giving them the same treatment of pulling out and holding the nipples, to make them fit for nursing in their adult years.[47]) Prevention and treatment for sore nipples vary with different writers—castor oil and a bismuth compound on a square of waxed paper, "aeration" by sewing a metal ring with semicircles of wire into the brassiere,[26a] and plastic nipple shields.[48]

For prevention as well as treatment of caked breasts, "uplift brassieres" or other elevating measures are advocated.[7] One author has suggested antepartum manual expression, to be continued two or three days post partum, to forestall caked breasts.[18a] If the condition occurs, the surgeon usually takes over; even so, many insist that "breast abscesses are not cause for weaning, provided no sinus is discharging." [2b]

41. Salley, E. McQ.: in discussion on Richardson, F. H.: Technique of Breast Feeding, North Carolina Med. J. 9: 310 (Oct.) 1948.
42. Ward, J. L.: Hypertonic Infant, with Special Reference to Pyloric Obstruction, Arch. Pediat. 44: 706 (Nov.) 1927.
43. Rosamund, J. H. E.: Breast Fed Babies Who Cry at Night, Southern M. J. 14: 768 (Oct.) 1921.
44. Rodda, F. C., and Stoerser, A. V.: Complemental Feeding and Care of the Skin of the Newborn, Wisconsin M. J. 37: 547 (July) 1938. Ward, L.: Personal communication to the author. Wyckoff.[26a]
45. Batemeier, I. H.: Concerning the Cornelian Corner, Am. J. Orthopsychiat. 27: 594 (Oct.) 1947; ibid. J. A. M. A. 136: 881 (March 27) 1948. Trainham, G.; Pilafian, G. J., and Kraft, R. M.: Case History of Twins Breast Fed on a Self Demand Regime, J. Pediat. 27: 197 (Aug.) 1945. Rowan-Legge, C. K.: Self Demand Feeding of Infants, Canad. M. A. J. 60: 388 (April) 1949.
46. de Petinto, M. P.: Breast Feeding, Med. ibera 2: 29 (July) 1938.
47. Rost, A. S.: Personal communication to the author.
48. Abramson, M.: Breast Feeding the Newborn (Evaluation of a New Technic of Breast Care) Gen. Pract. Clin. 4: 318 (Oct.) 1947.

Obstacles to Breast Feeding.—Most formidable of all obstacles to breast feeding is the indifference, and at times the actual opposition, of a large segment of the medical profession. Next comes the attitude of the hospital personnel in so many institutions, especially the nurses and supervisors, who naturally take their cue from those above them.

How discouraging their cynicism as to the feasibility of nursing can be to the mother who wants to nurse her baby is seen in two articles in a national women's magazine. They should be read and pondered by those physicians who deny that there exists such active opposition to breast feeding, as well as lack of interest and faith, on the part of a great many physicians, especially in the East.[49]

I would call to the attention of any physician who is still dubious about breast feeding as the most scientific method of feeding infants the words of a pioneer in this field. J. P. Sedgwick wrote in 1917: "We know enough now to save the breast milk for most of the babies who need it. It has become a question of getting the information to the profession and the nurses and the public."[50]

SUMMARY

An unsolved mystery has always been the willingness of so many physicians to abandon breast feeding without a serious effort to conserve it. A study of some four hundred titles has revealed as many differences of opinion, quite as ardently held, as were some of the various theories on bottle feeding for which physicians used to do battle so valiantly a generation or more ago.

If physicians who deal with infants will check these various views against their own experience and will develop individual technics, just as anyone must who employs artificial feedings in the care of infants, then it can truly be said that breast feeding has fully come of age.

ABSTRACT OF DISCUSSION

DR. ALICIA GALLAGA ROMERO, México, D. F.: This problem is not so disturbing in Mexico, since the Mexican woman from ancient times has attributed importance to nursing her children. There is an illustration of this in the old history of the Nahuatl, a tribe who once lived in the Valley of Mexico, in which we read that their women were trained to nurse their children. Whenever a woman gave birth to twins, the weaker child was killed so that the mother could have milk enough to raise a happy and healthy descendant. This idea was so much impressed in their minds that if a mother died while her child was still being fed at her breast, her soul was supposed to enter the House of Silence, where the Lord of Mictlan or Mictlantecuhtli ruled, and from this place she continued to nurse her child. But if it was the child who died during the period of suckling, it went to a mansion called *Chichihuacuauhco*, where there was a large tree from whose branches milk was dripping to feed the child. It is a well recognized fact in Mexico that most of the digestive disturbances in children fed by their mothers are benign, while most of the disturbances in children artificially fed are serious. Human milk does not require preparation, it is immediately obtained at the proper temperature, and it is free of bacterial contamination. Commercial milks are out of the reach of the poor classes with whom I work: 92 per cent of the city children are nursed at their mothers' breasts, while 98 per cent of the country children receive this type of feeding.

DR. M. HINES ROBERTS, Atlanta, Ga.: I shall give briefly my experience in feeding 1,000 newborn infants, or those brought during the first year of life chiefly for guidance as to nutrition. Over the years my own attitude has changed from that of the physician advocating breast feeding with almost religious fervor to one who presents the commonly accepted arguments for breast feeding to the mother. She is then permitted to make her own decision without persuasion or coercion. These babies were all from private practice, not from clinics. Only 763 babies were nursed at birth. The other 237, the mother chose not to attempt to nurse. Almost 25 per cent, then, of the entire group were weaned at birth. By two weeks of age, 149 additional infants had been weaned, making a total of 386, and by 1 month of age only 352 of the 1,000 infants remained at the breast; 648 babies (almost 70 per cent) had been weaned by 1 month of age, and of this number about one third were weaned chiefly because of the mother's refusal to attempt nursing. Another large group was weaned in the second month. Thereafter, the weaning was a gradual process, indicating that these 200 mothers had proved to be fairly successful milk-producers. Did early weaning prove detrimental? To answer that question correctly would require years of careful observation of the physical and mental development of these children, and such an answer I cannot give. Obvious and simple comparisons can be made, however. The comparative rates of gain in weight were observed in 313 babies who were weaned in the first 2 weeks of life and in 65 infants who were nursed until they were 5 to 10 months of age. The rates of gain in these two groups were compared with arbitrarily chosen standards of weight gain for given ages. Only 15.5 per cent of the babies in the artificially fed group fell below the average weight increments, whereas 32 per cent of the breast-fed babies were below this average. An attempt was made to determine the number of infants encountering feeding difficulties as related to the time of weaning. By "feeding difficulty" is meant the inability of the infant to take the commonly employed formulas. Patients requiring minor adjustments in the formulas, such as a change or reduction in carbohydrates or a lowering of fat content, were not considered to have feeding difficulties. Infants with severe cases of colic, diarrhea, milk idiosyncrasy or allergies—dermal, respiratory or gastrointestinal—necessitating basic changes in the formulas, are included in this classification. It is difficult to make any comparison between the ability of the breast-fed baby and that of the artificially fed baby to handle the basic food of their respective group. Since the infants exhibiting feeding difficulties were as a rule in much distress, drastic change in feeding seemed indicated, and in the case of the breast-fed baby this almost always meant weaning. Therefore the fact that the 96 babies who remained on breast feeding after 5 months of age experienced no feeding difficulties simply indicated that by this age all infants having such difficulty, or almost all, had already been weaned. Ninety-six infants had no feeding difficulties. If one compares the 648 babies weaned during the first month of life, when weaning was due, as a rule, to refusal or inability of the mother to nurse the infant, with those weaned at 2, 3 and 4 months of age, when weaning was due to increasing numbers of infants having feeding difficulties, a rough comparison can be made. It would seem that the percentage of infants having difficulty varies little in the two groups. It should be remembered that babies who have true feeding difficulties while receiving breast milk as a rule continue to have feeding problems on all artificial food. While I have no comparative figures, it is my impression that feeding problems, particularly those of allergic infants, are definitely on the increase. Certainly, for 648 babies, otherwise normal but weaned during the first month of life, a total of 93 (14 per cent) exhibiting feeding difficulties seems excessive. Whether or not early weaning is detrimental, physicians should be realistic and accept the fact that the large majority of the infants will not be breast fed and that their nutritional status on the whole appears as good as, or possibly superior to, that of infants who are breast fed.

DR. FRANK HOWARD RICHARDSON, Asheville, N. C.: This paper is not to be taken as propaganda for breast feeding. I have done enough of that in my time. This paper incorporates something that to the best of my knowledge has never before been presented, namely, a review of the literature on breast feeding showing many shades of opinion on the various cardinal points involved.

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EPIDEMIOLOGIC STUDIES OF Q FEVER IN SOUTHERN CALIFORNIA

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When Q fever was discovered in the metropolitan area of Los Angeles in 1947, extensive epidemiologic studies were undertaken to determine the source of human infection and disease. The studies were carried out by the National Institutes of Health in cooperation with the California State Departments of Public Health and Agriculture and the Los Angeles city and county health departments. More than 12,000 persons have been studied, and a detailed report will be published at a later date. The present report is a summary of the important epidemiologic findings which indicate that local dairy cows and their raw products, particularly milk, were the most frequent sources of human infection and that these infections have caused many persons to have an illness not heretofore recognized as Q fever.

Q fever was first described by Derrick in 1937. The disease is now generally recognized as an acute illness caused by a rickettsia, Coxiella burnetii. The illness often begins suddenly after an incubation period of two to three weeks, and it is commonly characterized by headache, high fever, severe sweats, malaise, weakness and pneumonitis demonstrable on roentgenograms. The fever usually lasts for one to two weeks and subsides by lysis, but the duration is variable. Infection occasionally produces no recognizable illness, often a mild to moderate illness of about one week's duration and not uncommonly a severe illness with prostration and high fever for three or more weeks. Relapses and prolonged sequelae occasionally occur. Nine deaths have been reported. A definite diagnosis can be established during the course of the disease by isolation of C. burnetii or by an increase of specific complement-fixing antibodies in the blood serums. Aureomycin appears to have definite value in treatment of the disease.

Prior to the Los Angeles studies nearly all the reported cases of Q fever occurred in sharp epidemics and were limited to special occupational groups (particularly research workers, military groups and those handling livestock).[1] In contrast, when Q fever was discovered in Los Angeles in 1947, cases were found to be occurring endemically in the general population.[2] An epidemiologic study of cases in Los Angeles led to the discovery of C. burnetii in the milk of local dairy cows by Huebner and others.[3] Further studies showed that commercial pasteurization substantially reduced but did not entirely eliminate the infection from milk.[4]

When 300 cases were found in Los Angeles,[2c] an epidemiologic analysis showed that the human cases were rarely if ever direct sources of infection for other persons and that insects and arthropods played little if any role in the spread of the disease to human beings. An environmental source of infection was hypothesized because, when compared with the general population, an unusually large proportion of the patients (*a*) resided less than ¼ mile from a dairy or livestock yard, (*b*) had occupational contact with cows, sheep or goats or their fresh products or (*c*) used raw milk in their households.

The case study permitted only a hypothesis as to the chief sources of the human disease because it was possible that the disproportionate case distribution could have resulted from a natural tendency to search for cases among persons having some direct or indirect contact with livestock. Actually, cases were found wherever a search was made, and the 300 cases reported were believed to be a small sample, and possibly not a representative one, of the naturally occurring disease in the area. Furthermore, infection was believed to be much more widespread than would be indicated by cases alone.[5] Thus, to determine the natural sources of human infection and disease, the case study was supplemented by extensive studies of specific population groups to observe the natural prevalence of past infection and disease.

STUDIES OF POPULATION GROUPS

Population groups of Los Angeles were selected so as to represent various degrees and types of ordinary contact of metropolitan persons with cattle and their products. To investigate whether persons living near a dairy were predisposed to Q fever, the population groups of five geographically limited, residential areas were studied. Each area included one or more known infected dairies, and persons residing various distances from the dairies were studied for evidence of past infection and disease. To investigate occupational contact, population groups comprised of employees of ten dairies, nine creameries, eight fertilizer plants, four fat-rendering plants, eighteen meat-packing plants, six hide plants and others were studied and, as controls, employees of two aircraft-manufacturing plants were studied. To investigate use of raw milk, confidential lists of raw milk customers were obtained from retail distributors and a population group comprised of persons living in households using raw milk was studied,

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(Footnote 1 continued in next column)

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5. Footnote 1 *c*, *d*, *f* and *g*.

together with a control group comprised of persons who lived in the four next adjacent households. In all studies, a blood sample for a complement fixation test was obtained from each person, together with an epidemiologic history of all attributes which were thought might possibly influence the occurrence of infection and disease. Since persons infected with C. burnetii generally retain demonstrable antibodies for several years, the epidemiologic histories covered the existence of these attributes during the past six and a half years, i. e., since December 1941. It was appreciated that the results depended on the reliability of the complement fixation test used. Hence a rigidly standardized Bengtson (warm water bath 37 C.) complement fixation technic was used uniformly throughout these studies.[6] The yolk sac antigens were prepared from the Henzerling strain of C. burnetii at the National Institutes of Health. The reactions were classified as positive when a definite, 3 or 4 plus, fixation of complement occurred at a 1:8 dilution or higher. For this report, all reactions of less titer were classified as negative.

Results.—Interpretation of results required an evaluation of the significance of a positive reaction in the complement fixation test used. To this end, the serums of more than 2,000 persons not located in Southern California were tested in the same laboratory, with the same technic, both before and during the Los Angeles studies. All persons who were definitely exposed to infection and in whom a proved infection developed gave a positive reaction, and a few persons also definitely exposed to infection gave a positive reaction even though they showed no definite clinical manifestations of the disease. In all these definite exposures, the complement-fixing antibodies developed after exposure. On the other hand, practically all persons (99.8 per cent) not known to be exposed to infection gave a negative reaction to the test used. These include 1,150 persons with various febrile illnesses not known to be Q fever, 293 persons with positive reactions to the serologic test for syphilis and 862 persons having occupational contact with livestock and raw milk in Chicago. As will be shown, persons having similar occupational contact in Los Angeles had a high proportion of positive reactions. In addition, the positive reactions of the Los Angeles group by and large follow a pattern of known exposure to a likely source of infection, and, when compared with the negative reactions, persons who reacted positively had a disproportionate excess of febrile illnesses which appear to have been unrecognized Q fever. Furthermore, random retesting of serums collected in Los Angeles showed remarkably uniform results. Thus, the complement fixation test used in the Los Angeles studies was highly specific for Q fever, and all evidence indicates that a positive reaction means past infection with C. burnetii. The detailed report will present additional but less direct evidence which indicates that the ingestion of killed C. burnetii or antibodies probably present in pasteurized milk could not account for many, if any, of the positive reactions. It will also show that the test used was of low sensitivity and probably reflects only a part of the total number of infections which have occurred among the persons studied.

Table 1 consolidates the various population groups studied into broad categories according to their general preselection for degree and type of natural contact with livestock and their raw products. The totals show that nearly 10,000 persons of Los Angeles and environs were studied, and the various groups show considerable variation in the percentages with a positive reaction to the complement fixation test. The first three groups (study numbers 23, 16 and 17 and controls of 13) embrace over 5,000 persons and are the groups selected to be representative of the general population of Los Angeles. The percentage of positive reactions is nearly equal in each of these three groups, and the total was 1.36 per cent. If this percentage is applied to the total population, it indicates that more than 50,000 persons in Los Angeles have been infected with C. burnetii during the past several years. Each of the other twelve groups was selected so as to have a disproportionately large number of persons who had some type of association with livestock or their raw products. The percentage of positive reactions is higher in each of these groups than in the three general population groups. It varies from nearly 4.0 per cent in packing plants slaughtering few or no young calves or dairy cows to 23 per cent in dairy workers.

TABLE 1.—*Distribution of Persons with a Positive Reaction to the Complement Fixation Test by Population Groups*

Study Number	Population Groups	No. of Persons	No. Positive	Percentage Positive
23	Routine premarital serums, Los Angeles	687	8	1.2
13	Raw milk study, controls only	1,564	21	1.3
16, 17	Aircraft manufacturing plants	2,964	42	1.4
2A	Meat packing plants slaughtering none or few calves or dairy cows	1,188	46	3.9
10F	Sheep pelts and wool sorters	40	2	5.0
21	Laundries for packing houses	30	2	6.7
6, 12, 14, 18, 19	Residential area studies	1,002	69	6.9
4	Fertilizer plants (cow manure)	127	10	7.9
7	Creameries	730	59	8.1
22	Horse meat packing plant	22	2	9.1
2B	Meat packing plants slaughtering many calves or dairy cows	520	59	11.4
13	Raw milk study, excluding controls	402	52	12.9
10A-E	Hide plants	66	20	30.1
15	Fat-rendering plants	241	52	21.6
20	Dairy workers	191	44	23.0
	Total	9,804	488	5.0

The persons in these population groups were then studied to determine how those with positive reactions differed from those with negative reactions. Some 30 different attributes were studied, and these included all attributes amenable to study which were thought might influence infection from a likely source or indicate additional sources of human infection. They included age, sex, race, occupation, place and type of residence throughout life, military service, vacations, travel in the country, visits to dairies, livestock yards and packing plants, household contact with various domestic animals, dietary sources and habits. An analysis of each of these numerous attributes showed that no one of them was directly and unquestionably associated with a positive or negative complement fixation reaction except the six to be discussed later. In some instances the numbers were too small to permit the conclusion that the attribute was not associated with a positive or negative reaction, e. g., persons who had visited local dairies, livestock yards or packing plants had a high proportion of positive reactions but comparatively few in the general population groups had made such visits. In other instances the numbers were large enough to indicate that the attribute was not associated with the result of the test, e. g., the ingestion of beef,

6. Huebner, R. J.: To be published.

veal, liver, pork, lamb or seafood was not associated with a positive complement fixation reaction. In all, it was concluded that the six attributes enumerated later indicate the important natural sources of human infection in this area.

TABLE 2.—*Distribution of Persons with a Positive Reaction to the Complement Fixation Test by the Attributes Found Associated with a Positive Reaction* *

	Attributes		No. of Persons	No. Positive	Percentage Positive
1	Residence <¼ mile from dairy or livestock yards	Yes	1,340	92	6.8
		No	7,203	370	5.1
2	Occupational contact with livestock or raw products	Yes	3,346	301	9.1
		No	5,217	159	3.0
3	Use of raw milk	Yes	1,687	171	10.1
		No	6,876	291	4.2
4	Began residence in Los Angeles prior to or since 1/1/47	Prior	7,217	442	6.1
		Since	1,346	20	1.5
5	Age in years at time of study	>39	2,708	212	7.8
		<40	5,855	250	4.3
6	History of illness diagnosed pneumonia, influenza or fever of undetermined origin †	Yes	1,708	201	11.8
		No	4,838	219	5.0

* Excludes persons with incomplete histories, i. e., all of study groups 6 and 22 and part of 16 and 17.
† Excludes all study group 16 and 17.

Table 2 enumerates the six attributes found to be associated with a positive serologic reaction and shows the number of persons and positive reactions for each. The table shows that (*1*) persons who had lived less than ¼ mile from a dairy or livestock yard (*2*) persons who had occupational contact with cattle, sheep or goats or with the processing of their raw products and (*3*) persons who had used raw milk all had a higher proportion of positive reactions than those who had not had such experience. Also (*4*) recent residents of Los Angeles had a lower percentage of positive reactions than those who had lived there for a longer period and (*5*) younger persons had a lower percentage of positive reactions than older persons. In addition, (*6*) persons who had a history of illness with fever of two or more days' duration, which was diagnosed as pneumonia, influenza or fever of undetermined origin, had a higher proportion of positive reactions than those who had no such history. The detailed report will show that each of these six attributes was associated with the result of the complement fixation reaction independently of the other five.

TABLE 3.—*Percentage Distribution of Positive Complement Fixation Reactions Among Persons in the Various Residential Area Studies According to Distance from Residence to Nearest Dairy*

		Area Total		Measured Distance Present Residence to Nearest Dairy					
				0 to ¼ Mile		¼ to ½ Mile		½ to ¾ Mile	
Study Number		No. of Persons	Per Cent Positive	No. of Persons	Per Cent Positive	No. of Persons	Per Cent Positive	No. of Persons	Per Cent Positive
12		152	3.3	66	3.2	53	3.8	33	3.0
14		330	5.2	92	12.0	97	1.0	141	3.5
19		235	7.2	103	6.7	58	10.3	74	5.4
Subtotal		717	5.4	261	7.7	208	4.3	248	4.0
18		178	6.7	178	6.7				
6		107	16.8	107	16.8				
Total		1,002	6.9	546	9.2				

An analysis of the various population groups according to these six attributes will be presented in the detailed report. For example, it will show that the 2 persons with positive reactions in table 1, study group 22, horse meat–packing plant, were among the 4 of this plant who had previously worked on the killing floor of meat-packing plants handling cattle. This summary report includes only the crude data of the area and occupational contact studies (tables 3 and 4) because they confirm the well recognized occurrence of the disease among persons having some association with infected livestock. In this report the raw milk studies are presented in more detail because milk has not heretofore been shown to be a source of human Q fever.

STUDIES OF AREAS

If residence near a dairy predisposes to infection, then persons living nearest to an infected dairy would have more opportunity for infection and should have a higher proportion of positive reactions. Table 3 shows the five geographic areas studied and the number of persons and percentage of positive reactions according to the measured distance from place of residence to nearest dairy. In the totals for the different areas the incidence of positive results ranged from 3 to 17 per cent. Incidentally this variation was directly correlated with the number of cows maintained on the nearby dairies. In the subtotals by distance from the dairy, there was a higher proportion of positive reactions among persons living nearest to the dairy, but this was not manifest in area 12, which had fewer cows than any other area.

TABLE 4.—*Percentage Distribution of Positive Complement Fixation Reactions Among Persons in Industrial Population Groups Having Contact with Cattle or Their Raw Products According to Intensity of Occupational Contact*

		Intense Occupational Contact		No Intense Occupational Contact	
Study Number	Population Groups	No. of Persons	Per Cent Positive	No. of Persons	Per Cent Positive
2A	Meat-packing plants (few or no calves or dairy cows)	535	6.0	653	2.1
21	Laundries (for packing plants)	12	16.7	18	0
4	Fertilizer plants	30	23.3	97	3.1
7	Creameries	225	13.7	475	5.1
2B	Meat-packing plants (many calves and dairy cows)	284	16.2	226	5.5
10A-E	Hide plants	40	30.0	56	14.3
15	Fat-rendering plants	216	23.1	25	8.0
20	Dairies	141	29.1	50	6.0
	Totals	1,513	14.9	1,610	4.2

To recapitulate the salient evidence found concerning the risk of infection among persons residing near a dairy in the Los Angeles area: (*a*) In the preliminary case study,[2c] an unusually high proportion of the 300 patients resided near a dairy or livestock yard. (*b*) In the total number of persons studied in various population groups (table 2) there was a higher proportion of positive complement fixation reactions among persons who had resided near a dairy or livestock yard than among those who had not. (*c*) In the total of the specific area studies, persons residing near a dairy (table 1) had a higher proportion of positive reactions than those in the groups representing the general

population. (*d*) Within the specific area studies, persons who lived nearest to a dairy tended to have a higher proportion of positive reactions than those who lived farther away.

STUDIES OF OCCUPATIONAL CONTACT

If occupational contact with cattle and their raw products predisposes to infection, then persons having intense exposure would have more opportunity for infection and should have a higher proportion of positive reactions. Table 4 shows the distribution of positive complement fixation reactions among employees of industries handling cattle or their raw products, according to intensity of such contact. In each plant the employees were classified into two groups: (*a*) those whose duties involved intense occupational contact, i. e., those who had intimate and frequent occupational contact with the live or freshly killed animals or with the raw products coming into the plants, such as milk and hides, and (*b*) those whose duties did not involve intense contact, i. e., the remaining employees who had less frequent and less intimate contact with such animals and their products. Table 4 shows that in each industry there was a higher percentage of positive reactions among persons classified as having had intense occupational contact than among those who had no intense contact. This was true even after adjustment was made for the influence of other attributes.

To recapitulate the salient evidence found concerning the risk of infection among persons having occupational contact with livestock and their raw products: (*a*) In the case study [2c] an unusually high proportion of the cases had occupational contact with livestock and their raw products. (*b*) In the total number of all persons studied in the various population groups (table 2), there was a higher proportion of positive complement fixation reactions among persons who had worked in industries handling livestock and their raw products than among those who had not. (*c*) In the various population groups studied, those in industries handling livestock and their raw products had a higher proportion of positive reactions than those in a nonlivestock industry, and they also had a higher proportion of positive reactions than the groups representing the general population (table 1). (*d*) Within the industries handling livestock and their raw products, those who had intimate and frequent contact with live or freshly killed dairy cows or their very young calves or certain raw products, such as milk and hides, had a higher proportion of positive reactions than those who had such contact to a less intense degree.

TABLE 5.—*Percentage Distribution of Positive Complement Fixation Reactions Among Persons in Various Population Groups According to Use of Raw Milk* *

Study Number	Population Groups	Used Raw Milk		No Raw Milk	
		No. of Persons	Per Cent Positive	No. of Persons	Per Cent Positive
16, 17	Aircraft manufacturing plants	388	4.4	2,129	1.2
13	Raw milk study	585	10.3	1,381	0.9
12, 14, 18, 19	Area studies	242	8.3	653	4.7
2	Meat packing plants	171	8.2	1,537	5.9
4	Fertilizer plants	29	10.3	88	6.8
21, 22	Laundry and horse plants	7	14.3	45	6.7
7	Creameries	90	11.1	631	7.6
10	Hide and pelt plants	8	25.0	128	15.6
15	Fat-rendering plants	34	22.4	207	19.8
20	Dairy workers	129	24.2	63	20.6
	Totals	1,701	10.1	6,862	4.2

* Excludes persons with incomplete histories, i. e., all study groups 6 and 23 and part of 16 and 17.

TABLE 6.—*Percentage Distribution of Positive Complement Fixation Reactions Among Persons in the Raw Milk Study, No. 13,* * *According to Age, Sex and Use of Raw Milk*

Sex Age	Used Raw Milk		No Raw Milk	
	No. of Persons	Per Cent Positive	No. of Persons	Per Cent Positive
Male	209	11.0	460	0.9
Female	325	10.5	725	1.0
Total	534	10.7	1,185	0.9
< 20 yr	87	4.6	196	0.5
20-39 yr	174	7.5	461	0.6
40-59 yr	190	13.7	321	0.6
60+ yr	83	16.9	207	2.4

* Excludes all recent residents (since Jan. 1, 1941) of Los Angeles and all who had history of possible association with livestock or its raw products either through occupation or residence near a dairy.

STUDIES OF RAW MILK USERS

Table 5 shows the percentage of positive reactions according to the use of raw milk in the various population groups. In each of the various groups, persons who had used raw milk in their households or otherwise at any time since 1941 had a higher percentage of positive reactions than those who had not. These consistent differences still obtained after allowance was made for the influence of other attributes.

Table 6 shows the sex and age distribution of positive reactors in the milk study. It excludes all recent residents of Los Angeles and all who had a history of possible contact with livestock or their products through either occupation or residence. It shows that, either by sex or age groups, persons who had used raw milk had a consistently higher incidence of positive reactions than those who had used no raw milk. It shows that with comparable exposure females were infected to the same extent as males. There is a progressive increase in the percentage of positive reactions with age among the raw milk users, but this is not definitely manifest in the small percentage of positive reactions among those who were not raw milk users.

If raw milk is a source of human infection, then persons who used it regularly would have more oppor-

TABLE 7.—*Percentage Distribution of Positive Complement Fixation Reactions Among Persons in the Raw Milk and Area Studies According to Regularity and Periods of Use of Raw Milk*

Regularity of Use	Periods of Use	Raw Milk Study		Area Study*	
		No. of Persons	Per Cent Positive	No. of Persons	Per Cent Positive
None	Not after 1941	1,381	0.9	667	4.6
Occasional (< 2 mo.)	12/41 to date	100	1.0	30	6.7
Regular	12/41 to 12/46 only	76	2.6	43	7.0
Regular	12/41 to 12/46 and 1/47 to date	344	13.1	88	8.0
Regular	1/47 to date only	65	18.5	67	11.9
Total		1,966	3.7	895	5.7

* Excludes study group 6.

tunity for infection than those who used it only occasionally. Also, persons who used raw milk only in the recent past would be more apt to have positive reactions than those who used it only in the remote past because of the loss of antibody with time. The latter hypothesis, of course, assumes a constant amount of infection in milk. Table 7 shows the distribution of persons with positive reactions in the raw milk and area studies according to regularity and periods of use of raw milk. The raw milk and the area studies are tabulated separately because of the consistently higher percentage of positive reactions in the latter. Table 7 shows that, independently in each of these two studies, persons who used raw milk regularly had a higher proportion of positive reactions than those who used it occasionally or not at all. It also shows that persons who used raw milk only since Jan. 1, 1947, had a higher proportion of positive reactions than those who used it only prior to that date.

To recapitulate the salient evidence found concerning the risk of infection among persons using raw milk in their household or otherwise: (*a*) In the preliminary case study,[26] an unusually high proportion of the 300 persons used raw milk in their households. (*b*) In the total number of persons studied in various population groups (table 2), there was a higher proportion of positive complement fixation reactions among persons who had used raw milk than among those who had not. (*c*) In the specific raw milk studies, persons who had used raw milk (table 1) had a higher proportion of positive reactions than the controls preselected in a random manner and also higher than those in other groups representing the general population. (*d*) Within the raw milk study, persons who had used raw milk regularly and recently had a higher proportion of positive reactions than those who had (table 7) used raw milk occasionally or in the remote past or not at all.

The relationship between infection with C. burnetii and the occurrence of clinical manifestations of the disease will be discussed in the detailed report. At the time blood specimens were taken, considerable effort was made to elicit a history of all illnesses with fever of two or more days' duration which were diagnosed as pneumonia, influenza or fever of undetermined origin. It was striking that 48 per cent of persons who had positive reactions gave a history of such illness, whereas only 27 per cent of those with negative reactions gave such a history. The higher incidence of illness among the positive reactors was uniformly consistent in the various population groups studied, and considerable evidence is at hand showing that the excess illness among these persons was due to previously unrecognized Q fever.

SUMMARY

1. The complement fixation test used was shown by epidemiologic study to be highly specific for recent infection with Coxiella burnetii. The test used was of low sensitivity and reflected only part of the total past infections which had occurred.

2. Q fever has been occurring endemically in the Los Angeles area for several years, and it is highly probable that more than 50,000 persons have been infected with C. burnetii during recent years. It appears that a sizable proportion of these infections caused many persons to have an acute illness, with fever for two or more days which was not heretofore recognized as Q fever.

3. The most frequent and by far the most important sources of human infection were local dairy cows, their very young calves and some of their raw products, particularly raw milk and hides.

4. The persons most apt to have been infected were those who had used raw milk in their households, those whose residence had been located near a dairy or livestock yard, those who had worked in industries handling live or recently killed local dairy cows and young calves, e. g., employees on dairies, in meat-packing plants and fat-rendering plants, and employees handling the raw products of such animals, e. g., employees of creameries and hide plants.

DIAGNOSTIC VALUE OF THE IODOACETATE INDEX (HUGGINS-MILLER-JENSEN TEST)

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The discovery of a reliable laboratory diagnostic cancer test would be of the greatest value for the welfare of mankind. It is for this reason that every observation on differences between body fluids of patients afflicted with a malignant new growth and of persons not so diseased must be carefully recorded. No matter how minute such differences might be and how modestly such observations are presented, they will attract the attention of the physician and the layman alike.

Huggins, Miller and Jensen [1] found that the majority of blood serums of patients with malignant growth show deficient heat coagulation when treated with iodoacetic acid, while only a minority of serums of patients with nonneoplastic disease have the same chemical property. This observation was widely hailed as discovery of "the" cancer test. Reevaluation of this finding became most important, especially as the authors of the iodoacetate index did not reveal detailed data on their patients.

TECHNIC

The original technic called for adjustment of the p_H of the iodoacetate reagent by titration of a solution of iodoacetic acid in a phosphate buffer with a sodium hydroxide solution using phenolsulfonphthalein as an indicator until the color matched that of a control preparation without the iodoacetic acid. We found that comparison of colors is difficult and that at the point at which the colors were alike the p_H of the two solutions differed by 0.5 to 1.0. We therefore measured the p_H of the reagent with the aid of Beckman's apparatus and adjusted the reaction to a p_H of 7.4 (7.38) by adding the necessary amount of normal sodium hydroxide solution. The reagent was prepared fresh daily.

The other two solutions needed were used as originally described. The fifteenth-molar phosphate buffer, p_H 7.4, was prepared by dissolving 1.743 Gm. of potassium dihydrogen phosphate and 7.652 Gm. of anhydrous disodium hydrogen phosphate in distilled water and diluting to a volume of 1,000 cc. The third-molar sodium chloride solution was prepared by dissolving 17.56 Gm. of this salt in distilled water and making the volume up to 100 cc.

Determination of serum albumin was omitted because calculation using serum albumin instead of serum pro-

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1. Huggins, C.; Miller, G. M., and Jensen, E. V.: Thermal Coagulation of Serum Proteins: II. Deficient Coagulation in Cancer and the Iodoacetate Index, Cancer Research 9:177-182 (March) 1949.

tein values yielded comparable results. The total serum protein was determined by the colorimetric method of Greenberg.[2]

The arrangement of the test itself was the same as that used by Huggins and his co-workers.[1] It is shown in the table.

Arrangement of Experiment

Tube Number	1	2	3	4	5	6	7	8	9	10
Iodoacetate, mM	9.0	10.8	12.0	13.8	15.0	16.8	18.0	19.8	21.0	22.8
Iodoacetate, cc.	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.35	0.38
Buffer, cc.	0.23	0.20	0.18	0.15	0.13	0.10	0.08	0.05	0.03	0.00
Serum, cc.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Saline, cc.	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12

It was found that the incubation period of thirty minutes could be safely shortened and final reading could be made after twenty minutes from the moment the test tube rack was placed into boiling water. The negative serums with a coagulum in all ten test tubes could be eliminated after ten minutes of incubation. Two readings, one after ten and the second one after twenty minutes, were substituted for the single check after thirty minutes' incubation.

Calculation of the index followed the formula of Huggins and his associates:[1]

$$\text{Iodoacetate index} = \frac{\text{mM iodoacetate} \times 4}{\text{protein in Gm. per 100 cc. serum}}$$

MATERIAL

The iodoacetate index was determined on clear blood serum of 250 persons. Eighty patients suffered from neoplastic disease as diagnosed by biopsy, cell block, surgical specimen or necropsy. One hundred and seventy persons were in good health, had minor impairment of health or were severely ill but their disease was not of a neoplastic character. Obviously, malignant new growth could be definitely excluded only in persons who had died and on whom a postmortem examination was performed.

RESULTS

To facilitate analysis of observations, the patients were grouped according to "correct positive" (group I), "false positive" (group II), "correct negative" (group III) and "false negative" (group IV) results of the serum iodoacetate index.

Division into "correct" and "false" was based on the arbitrary selection of an index of 9.70 as the maximum correct positive and of 9.71 as the lowest correct negative result.

Group I.—Seventy-three correct positive results were obtained. The minimum, average and maximum ages of 30 men in this group were 44, 67 and 86 years, and the corresponding figures for 43 women were 24, 57 and 85 years. The site of carcinoma in these patients was as follows: skin, 4; vulva, 1; cervix, 8; uterus, 4; ovary, 5; breast, 10; testis, 1; prostate, 4; kidneys, 3; lungs, 4; stomach, 3; cecum, 1; colon, 8; sigmoid, 5; rectum, 3, and pancreas 6. One patient each had lymphosarcoma, Hodgkin's granuloma and chronic myelogenous leukemia. Morphologically, a variety of neoplasms was observed. Among the breast tumors, for instance, all known histologic types were represented. Twenty-eight times the presence of metastasis was proved at the time blood was secured for the assay. Six times autopsy blood was used for the first and twice for the second determination of the iodoacetate index.

Group II.—Seven blood samples rendered false negative results. Four of these samples were obtained from men and three from women. The average age of the patients in this group was 59 years. The locations of the new growths were the thyroid, uterine fundus, breast, stomach (twice), colon and rectum. The adenocarcinomas were of grade I, II or III, and 4 of these 7 patients had metastasis. Once, blood for the reaction was obtained at autopsy.

Group III.—One hundred and forty-seven correct negative results were recorded in our series. The inclusion of a large number of healthy young women was responsible for the preponderance of the female sex in this group of persons as well as for the lower average age. The minimum, average and maximum ages of 33 men were 18, 51 and 87 years, respectively, and of 114 women 12, 31 and 72 years. After deduction of 33 blood samples of pregnant women and of 10 healthy young women, the average age for women equaled 46 years; still, the number of women remained more than twice that of men. Seventeen persons had minor ailments. Twelve patients with an array of respiratory diseases included 1 with arrested pulmonary tuberculosis. One person had cardiovascular syphilis, and 8 had other ailments of the circulatory organs. All types of diseases of the digestive tract were diagnosed among 15 patients, while 7 had disease of the liver or gallbladder. Among 6 patients with morbidity of the urinary organs were 2 with papilloma of the bladder and 1 with active renal tuberculosis. Four men had benign hypertrophy of the prostate. In 16 women, various diagnoses of conditions affecting the genitalia included 5 instances of endometriosis, 2 of uterine leiomyoma and 2 of ovarian cystadenoma. Seven women had inflammatory, degenerative or benign neoplastic disease of the breast. Finally, in a group of 11 patients, widely divergent conditions were observed: Two patients had poliomyelitis, 2 had arthritis, 1 suffered from colloid and 1 from hyperplastic goiter, others had dermatitis, ophthalmia and sialadenitis and 2 were discharged without a final diagnosis.

Group IV.—Twenty-three results were held false positive. Among the patients there were 12 males and 11 females. Many of them were rather young. The minimum, average and maximum ages of the males were 15, 68 and 83 years and that of the females 13, 41 and 72 years. Only 3 of these patients died, and the causes of death were determined at necropsy as uremia due to chronic glomerulonephritis, traumatic intracranial hemorrhages and cerebral hemorrhage and bronchopneumonia. The clinical diagnoses for the other 20 persons whose iodoacetate index was low were as follows: pregnancy, congenital cerebral defect, osteoid osteoma, bronchopneumonia, lobar pneumonia, peptic ulcer, cholelithiasis, chronic prostatitis, benign hypertrophy of the prostate, prostatic hypertrophy paired with bladder polyp, hematocele, polypous hyperplasia of the endometrium, ovarian endometriosis and leiomyoma of the uterus, endometrioma and tuboovarian abscess, fibroadenoma of the breast, diabetes and nephrosclerosis, familial teleangiectatic purpura and an undiagnosed condition (possibly gastric lymphoma). The only diagnosis made twice was active pulmonary tuberculosis.

ANALYSIS

In the series of 250 persons, the serum iodoacetate index of 7 out of 80 patients (8.75 per cent) with proved malignant neoplasm was 9.71 or higher and thus false negative. On the other hand, 23 of 170 (13.53

2. Greenberg, D. M.: Colorimetric Determination of the Serum Protein, J. Biol. Chem. 89: 545-550 (March) 1929.

per cent) serums of persons apparently without malignant new growth rendered an index of 9.70 or less, held to be false positive. The total number of false reactions in a series of 250 persons numbered 30 (12 per cent).

These figures could easily be altered by selecting different indexes as maximum positive and minimum negative, respectively: By selecting 9.71 (instead of 9.70) as the highest correct positive index, two correct negative results (a serum from a pregnant woman and a serum of a patient with pulmonary tuberculosis) would become false positive. By selecting 9.0 as the highest positive (low) index, as suggested by Huggins,[3] the number of false negative results in our series of 80 serums from patients with neoplasm would rise from 7 to 14, while, on the other hand, the number of false positive results would drop from 23 to 12 in 170 serums. The total number of false results would drop from 30 to 26. The test could be made more specific but would lose its diagnostic sensitivity considerably.

A sharp dividing point between positive and negative results had to be chosen if the experiment was to be analyzed as to its diagnostic value. The overlap of indexes was found by Huggins and others [1] to lie between 8.36 and 9.96. Applied to our series, the results would have to be changed so that of 80 serums from patients with malignant neoplasm, 62 would yield a positive, 11 a doubtful and 7 a false result, while of 170 serums from persons without malignant growth, 131 would give a correct negative, 29 a doubtful and 10 a false positive result. This would make a total of 57, that is, 22.8 per cent, incorrect reactions.

Patients with Proved Malignant New Growth.—A study of the results in our series, based on the arbitrary standards set by us, revealed no differences in the group of patients with a malignant neoplasm whose serums showed a positive reaction and those whose serum iodoactate index was too high to be held positive. The number of men and women was about equal in each group, and the average age was 61 years in both groups.

The variety of growths, as far as the morphologic pattern, the grade of malignancy, the original site and the frequency and site of metastasis were concerned, was the same in the positive and in the negative group. All but 3 patients had one or another type of carcinoma. While our patients with lymphosarcoma, Hodgkin's disease and leukemia fell in the positive group, patients with mesenchymal tumors or with blood dyscrasia should be investigated on a larger scale.

The fact that of the 7 patients who had a negative index 4 had carcinoma of the gastrointestinal tract should not be held significant, for in the positive group of 73 serums, tumors of the digestive system numbered 20.

Among the 23 persons with false positive reactions 11 were women and 12 were men, the number of men being unproportionally high. No explanation was found for this occurrence.

Patients in Whom Malignant New Growth Was Not Proved.—In the control series of 170 persons, malignant neoplasm was excluded with a fair degree of certainty on the basis of clinical signs and symptoms and laboratory and roentgenologic studies. This series included 10 persons who apparently were in perfect health and 17 persons whose impairment of health was of a minor or temporary nature (varicose veins). All these had an iodoacetate index which fell into the category of negative results.

This series also included a group of 30 primiparous or multiparous women in the various stages of normal gestation and 4 women from whom blood was taken after incomplete miscarriage. Only 1 of these 34 had serums which yielded an index considered positive (8.80). Study of this patient's chart up to the time of her discharge did not disclose anything which would explain the result of the test.

A correction of the results of the reaction in the 170 control persons by subtracting the number of 10 "normal" and 17 "about normal" persons would reduce the number of controls and change the percentage of false positive results from 13.53 to 15.97. By subtracting further the number 34 for the pregnant women, the number of false positive results would, after correction for the positive reaction in 1 of these women, increase to 20 per cent. Obviously, the overall results could be easily changed, simply by increasing the number of serums from healthy persons, who persistently give normal high indexes.

Among Huggins' [4] patients without neoplasm whose serums had a low (positive) iodoacetate index were those with pulmonary tuberculosis, pneumonia, nephritis and pregnancy. In our series, 3 patients had pulmonary tuberculosis; 2 with a positive sputum rendered a positive reaction and 1 with a negative sputum gave a negative reaction. In the serum of a patient with active renal tuberculosis the index was high (negative), but his lungs were free of an active process. Against 5 serums with negative indexes among patients with various forms of pneumonia, we found 2 with a low iodoacetate index. In our series, the serum of 1 patient with pyelonephritis gave a negative reaction, while that of a patient with chronic glomerulonephritis was positive. As to the conditions of the other patients whose serums rendered false positive results, the same diagnoses were established in a number of patients whose indexes were correct negative.

In the final analysis of correct negative and false positive results, one has to be aware of the fact that absence of a malignant neoplasm can definitely be proved by necropsy only. In our group of 23 patients with false positive reactions only 3 were examined after death, and but 2 of the 147 patients whose serums gave correct negative reactions were given a postmortem examination.

COMMENT

Huggins and his co-workers [1] made their report on the deficiency of heat-coagulable proteins, after the addition of iodoacetate, in serums of patients with malignant growth without any intention of presenting it as a diagnostic test for carcinoma. Our experience with this reaction would suggest that the determination of the iodoacetate index is in its present form not suitable as a diagnostic test. The incidence of "incorrect" results is too high. The phenomenon is of great interest and is certainly worth extensive further research.

In an effort to find a common denominator for "false" results, the charts of all 250 persons of our series were viewed and particular attention was paid to

3. Huggins, C.: Serum Proteins in Cancer, Cancer Research **9**: 321-328 (June) 1949.

4. Huggins, C., and Jensen, E. V.: Thermal Coagulation of Serum Proteins: I. The Effect of Iodoacetate, Iodoacetamide, and Thiol Compounds on Coagulation, J. Biol. Chem. **179**: 645-654 (June) 1949. Huggins, Miller and Jensen.[2]

the pathologic processes with a tendency to cellular proliferation and to hyperplasia. In a group of 22 patients with nonmalignant neoplasms or hyperplastic alterations in the breast, uterus, ovaries, prostate or thyroid gland, only 4 serums fell into the false positive group. Two of these serums had a high protein content, which in the presence of a coagulum in all ten test tubes was responsible for the low iodoacetate index.

Huggins, Jensen, Player and Hospelhorn [5] mentioned that the iodoacetate index often decreases markedly in persons with normal original values after they are subjected to trauma and that within eight hours after a surgical operation a marked drop of heat-coagulable proteins can occur. With the exception of the patient who died of intracerebral hemorrhages in spite of surgical removal of a subdural hematoma, not a single false positive result in our series could be explained by traumatism. Serums of 5 patients with various fractures and of 2 with lacerations had a high iodoacetate index.

In 1 woman the iodoacetate index was 8.61 three days after radical mastectomy for carcinoma, against a preoperative value of 7.68. The slight shift was due to a change in the total amount of serum protein. A similar elevation of the index, from 7.69 to 8.50, was observed in a patient two months after surgical operation for carcinoma of the cervix. Here, too, the amount of heat-coagulable protein had remained the same and the increase of the index was caused by the rise of total serum protein. Three months after radium therapy of a cervical carcinoma the iodoacetate index of the patient had risen from 8.3 to 9.23. While no evidence of neoplasm was found on histologic examination, the index had remained within the positive range. In spite of a pronounced increase of the heat-coagulable fraction, the rise of the index of this patient was but slight because of the concurrent drop of the total serum protein value. On the other hand, the serum index of a man with carcinoma of the sigmoid was 8.3 prior to removal of the growth, 5.9 one day postoperatively and 5.6 three days postoperatively. A woman who suffered from a papillary adenocarcinoma of the ovary with metastasis throughout the body had at the time the diagnosis was established an index of 8.9 and four months later, at necropsy, an index of 7.8. While there is a reciprocal relation between the level of the index and the extent of neoplastic disease in some patients, such relation is absent in others. This is due to the fact that the iodoacetate index is the result of two variable components, the heat-coagulable and the total serum protein. Both factors are subject to rapid change. The speed with which regulation of the protein fractions occurs becomes also apparent from the observation that even multiple blood transfusions fail to exert a marked or lasting influence on the pattern of blood proteins.

One of the possible approaches for further investigation might be the periodic examination of patients in whom a neoplasm was removed by surgical operation or healed by actinotherapy. In our series, we encountered 2 patients in whom a proved malignant growth had been removed nine months and six years prior to a test which yielded a negative result. However, at the time the growth was present the iodoacetate index had not been determined. The first patient had had carcinoma of the breast with metastasis to regional lymph nodes, and the second patient had had carcinoma of the descending colon. The two serums were included among the correct negative control group as no evidence of neoplasm was found at necropsy.

Periodic postoperative study of the serum of persons whose index was found low (positive) before and high (negative) after operation would allow plotting of a curve. Such analysis would enable us in these selected patients to determine whether the index would fall again with the development of metastasis.

In none of our patients could the diagnosis of malignant new growth be reliably based on the iodoacetate index determination. In patients whose growth was not readily accessible to biopsy, the results of serum examination obscured rather than facilitated the diagnosis. All this speaks rather highly for our diagnostic ability based on biopsies and related examinations, on roentgenologic studies and on clinical investigations. It is not our intention to imply that efforts should not be made toward the development of a diagnostic test which would be suited to screen a population for the detection of early cancer.

SUMMARY

The diagnostic value of the iodoacetate index (Huggins-Miller-Jensen test) was assayed on 80 blood serums from patients with proved malignant growth and on 170 control serums.

At the present time, this reaction is not suitable as a diagnostic test. Further investigation might bring about the development of a reaction the result of which would show better correlation with disease.

5. Huggins, C.; Jensen, E. V., Player, M. A., and Hospelhorn, V. D.: The Binding of Phenolsulfonephthalein by Serum and by Albumin Isolated from Serum in Cancer, Cancer Research 9:753-757 (Dec.) 1949.

SIGNIFICANT SCROTAL SWELLINGS

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Scrotal swellings are relatively common. It is not the purpose or scope of this paper to present a detailed account of all the pathologic conditions that may affect the scrotum and its contents. Rather I propose herein to briefly review features pertinent to certain phases of scrotal enlargements which have been observed and to discuss a few of the salient features of the more significant lesions. On occasion a scrotal enlargement may not be without its merits, for, had it not been for a huge hydrocele incapacitating the historian Gibbon,[1] the notable volumes comprising "The Decline and Fall of the Roman Empire" might never have been written! It is amazing how tolerant many patients can be of large scrotal masses when these are unassociated with pain, even though the masses must cause considerable inconvenience at times.

Of 31,353 urologic patients discharged from the Los Angeles County General Hospital and the White Memorial Hospital during the past twelve years, 3,125, or about 10 per cent, presented scrotal swellings (see the accompanying table).

NONINFLAMMATORY LESIONS

Representing 16 per cent of the total number of scrotal enlargements were 499 noninflammatory lesions involving the tunics and embracing the pathologic con-

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1. O'Malley, C. D.: Some Material on Death of Edward Gibbon, Bull. Hist. Med. 13:200 (Feb.) 1943.

ditions of hydrocele, hematocele, spermatocele and scrotal hernias.

The presence of a smooth, nontender, fluctuant mass that transilluminates indicates the presence of a hydrocele. In spermatocele and hydrocele of the cord the testicle is palpable; when small, the mass may

Cases of Scrotal Swelling Observed from 1936 to 1948, Los Angeles County General Hospital and White Memorial Hospital

Total urologic patients discharged from the two hospitals during the twelve year period		31,550
1. Noninflammatory lesions:		
Hydrocele (cord and tunica vaginalis), spermatocele, hematocele	224	
Hernia, scrotal	275	499
2. Inflammatory lesions:		
Epididymitis (tuberculosis and nonspecific)	1,774	
Gonococcic epididymitis	255	
Orchitis	239	2,368
3. Acute urinary extravasation		132
4. Testicular tumors		97
5. Torsioned testicles		27
6. Elephantiasis		2
Total cases of scrotal swellings		3,125 (10%)

suggest the presence of a third testicle in the scrotum. In ordinary hydrocele of the tunica vaginalis the testicle is often difficult to identify by palpation. When multilocular cysts are present, only the total extirpation of all the cysts will effectively prevent recurrence. If the incision is adequate and the sac is left intact, unless the operation is complicated by inflammation, the sac can usually be readily pealed from its bed. Bleeders should be painstakingly controlled. It can be disturbing to the equanimity of any surgeon to return, after scrotal surgery, to find the scrotum transformed into what appears to be an eggplant. The retraction of the deeper tunics requires sutures which will adequately approximate all the severed edges and help prevent oozing. Elastic adhesive used as a firm compression bandage will help to prevent scrotal edema.

Occasionally hydrocele is associated with tumor. The possibility should always be suspected, and careful palpation of the scrotal contents should be made when treatment by aspiration and sclerosing mediums is utilized.

Scrotal hernias must be differentiated. There were 275 in this series. A scrotal mass due to hernia will not transilluminate, the spermatic cord cannot be palpated above the mass, an impulse will be felt on coughing, and the mass may be reduced by taxis. Hernia must always be ruled out before one considers diagnostic needle aspiration.

INFLAMMATORY LESIONS

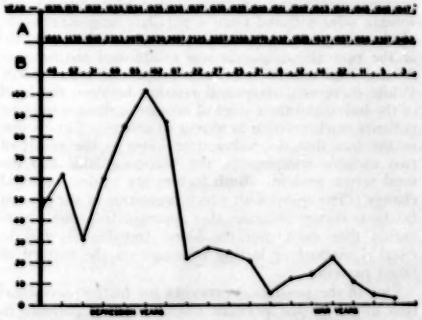
Inflammatory lesions involving the epididymis and testes were encountered most frequently. Of the total number of scrotal swellings 2,368 (76 per cent) were epididymitis, which included gonorrheal and tubercular types, as well as those of nonspecific origin. A remarkable decline in the number of cases of gonorrheal epididymitis was apparent during the past decade (see the illustration), probably as a result of sulfonamide and antibiotic therapy which reduced the morbidity and complications. Because of the prolonged disability in traumatic epididymitis, it is the responsibility of the examiner to determine fairly whether his observations justify compensation.

ACUTE URINARY EXTRAVASATION

Acute urinary extravasation or infiltration is the result of a rupture of the urethra with stricture or injury and the invasion of the tissues with urine, which may be infected with anaerobic organisms. These cases are not often seen in private practice. In this series there were 132 cases (4 per cent). In a charity institution patients with this condition are usually described by members of the house staff as suffering from a "homeless syndrome." As alcoholic addicts, they are picked up in gutters or "flophouses," human derelicts apparently without home, friends or relatives. The patient is insensitive to his distended bladder and is unaware of the infiltration of urine through the ruptured urethra into the scrotal tissues, resulting within a few hours in tumefaction and cellulitis. The advance of the swelling posteriorly and laterally is limited by the fascial attachments, but extravasation readily passes anteriorly over the pubic area under Scarpa's and Camper's fascia of the abdomen and may extend as high as the axilla. Crepitation in the tissue is frequently present. Catherization is often difficult because of the presence of associated stricture. The scrotum, edematous at first, later has dark necrotic areas from the loss of blood supply. The patient rapidly becomes toxic and stuporous. The pulse rate becomes accelerated. Only by radical incision and drainage of the involved tissues and a most liberal use of sulfonamide drugs and antibiotics can the patient be saved.

TESTICULAR TUMORS

There were 97 cases (3 per cent) of testicular tumors. Most tumors of the testicle are malignant; hence, the only hope of cure must lie in the prompt recognition and surgical treatment of these lesions.



Incidence of gonococcic epididymitis, Los Angeles County General Hospital 1930-1947; *A*, total number of urologic patients discharged annually; *B*, number of patients with gonococcic epididymitis.

This may be difficult to achieve at times, since the lymphatic vessels of the testicle and scrotum drain chiefly into the retroperitoneal nodes in the preaortic region. Because of the deep drainage, early metastasis can be present without being readily detected. Pulmonary metastasis may also occur by way of the thoracic duct; therefore roentgenograms of the chest are

advised for all patients with testicular tumors. Testicular tumors should be suspected when the examiner palpates a nontender, firm mass of leaden weight which fails to transilluminate. Although follicle-stimulating hormone is not always found in the urine, its presence may be valuable confirmatory evidence. Of the malignant growths that involve the testicle, seminomas are the most frequently encountered type. High voltage roentgen therapy of the preaortic nodes, which are radiosensitive, is advised. The surgical approach should be made through an inguinal incision, ligating and dividing the cord before removing the tumor from the scrotal sac.

According to Brockbank,[2] scrotal carcinoma is becoming more frequent. When the carcinoma is due to the carcinogenic hydrocarbons of mineral oils and coal tar, this can assume importance from the standpoint of preventive medicine. Industries that expose workmen to prolonged contact with carcinogenic agents should offer adequate skin protection and periodic examination of any thickening of the scrotal skin.

TORSIONED TESTICLES

Of the total group of 3,125 cases of scrotal enlargement reviewed, there were 27 cases, or not quite 1 per cent, of torsion of the cord. If the torsioned testicle is to be saved, it is of extreme importance that the condition be recognized early. Torsion can occur only where congenital development provides a long mesorchium, permitting great mobility of the testicle within the scrotal sac. When torsion occurs, pain is sudden and acute, varying in severity with the completeness of the twist. The pain may be excruciating. On early examination the testicle is usually found to be elevated, with slight edema of the skin above the cord. Later, edema becomes more pronounced and recognition of the torsion by palpation becomes difficult. Acute epididymitis is readily confused with torsion of the cord. Many a testicle that might have been saved by prompt treatment has become infarcted and gangrenous because failure of prompt recognition dictated expectant treatment. When the condition is diagnosed early, detorsion may be successful. Surgical immobilization of both testicles to the scrotal sac to prevent recurrence is always indicated, because the etiologic factor is bilateral.

ELEPHANTIASIS

Elephantiasis, although common in some tropical areas, is seldom found in this country. Only 2 cases were observed in this series.

SUMMARY

A review of 31,353 urologic patients discharged from the Los Angeles County General Hospital and the White Memorial Hospital revealed a total of 3,125 significant scrotal swellings.

The abrupt decline in the incidence of gonorrheal epididymitis coincides with the advent of sulfonamide and antibiotic therapy, which has reduced the morbidity and the complications in cases of acute specific infection.

Inflammatory lesions involving the testes and epididymides comprised by far the largest group of cases.

The importance has been stressed of early diagnosis and adequate treatment for such serious lesions as acute urinary extravasation, testicular tumors and torsion of the cord.

In industries which expose their workers to prolonged contact with carcinogenic agents, adequate prophylactic care of the skin is necessary to prevent skin cancer.

1216 Wilshire Boulevard (14).

2. Brockbank, E. M.: Industrial Epithelioma Especially in Cotton Operatives, Clin. J. 71:180 (Sept.-Oct.) 1942.

ABSTRACT OF DISCUSSION

DR. MONROE WOLF, New Orleans: Dr. Bergman mentioned hernia. I would like to report 2 cases that we have seen in the last eight months, of scrotal enlargement, transilluminated perfectly. In congenital or any type of hydrocele the fluid cannot be evacuated from the scrotum. Both cases were of congenital hernia, 1 in a child aged about 7 years and another in a child aged about 14, in which traction on the scrotum evacuated effused ascitic fluid into the abdominal cavity and in which exploration disclosed definite congenital hernia. Several of the textbooks, I believe, describe these lesions as congenital hydrocele, a misnomer. The internal ring was so small and the canal was of such diameter that bowel could not get into the scrotal cavity, but effused ascitic fluid accumulated in the scrotal sac. Another point that Dr. Bergman brought out is torsion of the spermatic cord and testicle. Unfortunately, many medical students are not instructed that torsion does occur. On two occasions I have sent patients with acute torsion, to whom I had given notes, from my office to Charity Hospital, New Orleans, but the resident members of the staff knew nothing of torsion and dismissed them, thinking that I was mistaken and had sent in patients with subacute epididymitis.

DR. JAMES C. KIMBROUGH, Washington, D. C.: In the military service, involving more than one and one-half million young men in the testicular tumor age, it is important always to keep in mind the possibility of testicular tumor in dealing with any mass in the scrotum. The treatment of testicular tumors, to give good results, depends on early diagnosis and rapid operation. A great many patients with testicular tumors are seen at our general hospitals who have been treated up and down the line of evacuation for several months. Usually epididymitis is the primary diagnosis. When the lesion does not respond to chemotherapy and begins to get larger, patients are transferred to the general hospital, when it is too late to get a cure by any type of radical operation. The plea I want to make is for early diagnosis of scrotal tumors. As Dr. Bergman said, consider every mass in the scrotum as malignant until proved otherwise.

DR. R. THEODORE BERGMAN, Los Angeles: Traumatic epididymitis, as has been brought out by Dr. Kearns, is an economic catastrophe for many patients who are working for a living. If the traumatic epididymitis can be considered a compensable injury, they are eligible for assistance. However, if they cannot prove that it is compensable, then it is financially distressing for them. Hence, when an acute swelling occurs, they try to attribute it to a fall or a strain, or something of that nature. There is a difference of opinion, even among urologists, whether such a thing as traumatic epididymitis does occur. But one may have a contusion of the testicle, just as one may have a contusion of any other part of the body, that is evident when one observes it, and certainly epididymitis can occur. If infection is found in the prostate or in the seminal vesicles, workmen are not eligible for compensation. However, if it can be determined that the infection is of tuberculous origin, I believe the consensus is that it can be considered contributory toward their disability.

Commissions.—When a patient is referred by one physician to another for consultation or for treatment, whether the physician in charge accompanies the patient or not, the giving or receiving of a commission by whatever term it may be called or under any guise or pretext whatsoever is unethical.—Section 5, Chapter III of the PRINCIPLES OF MEDICAL ETHICS of the American Medical Association.

NEUROCIRCULATORY ASTHENIA (ANXIETY NEUROSIS, EFFORT SYNDROME, NEURASTHENIA)

A Twenty Year Follow-Up Study of One Hundred and Seventy-Three Patients

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Neurocirculatory asthenia (anxiety neurosis, effort syndrome, neurasthenia) is a common disorder, possibly occurring in 5 per cent of the population.[1] Although it has been the subject of many reports, including recent ones from this laboratory emphasizing physiologic abnormalities,[2] there is little information in the literature concerning the course of the disorder in patients who have been followed for a period of years. Since there were available from the files of one of us (P. D. W.) records of many patients with such a diagnosis at least twenty years ago, it was possible to do a follow-up study, the purpose of which was to learn more about the course of neurocirculatory asthenia and the state of health of these patients over the years and, in addition, to learn some facts about their psychologic and social adjustment, the diseases they had and the number and manner of their deaths.

METHODS AND TECHNICS

One hundred and seventy-three patients with neurocirculatory asthenia (anxiety neurosis, effort syndrome, neurasthenia) were followed up twenty or more years after the diagnosis was first made. These patients were selected, located and studied according to the methods and technics described in the following paragraphs.

Definition.—Neurocirculatory asthenia is a state of ill health characterized by a large number of symptoms, including breathlessness, palpitation, chest pain, nervousness, fatigue, headache, dizziness, sighing, attacks or spells, apprehension, trembling and discomfort in crowded places, in the absence of other disease which might reasonably account for these symptoms. Signs are not characteristic and consist of slight tachycardia and tachypnea, tremor of the fingers and overactive deep tendon reflexes. It is probable that the terms neurocirculatory asthenia, anxiety neurosis, effort syndrome, neurasthenia and many others are used in the literature to describe the same disorder, as has been pointed out by Cohen, White and Johnson,[2b] among others.

Selection of Patients.—The selection of patients with neurocirculatory asthenia uncomplicated by other disease was based on the following data recorded twenty or more years ago in the patients' records: (1) a diagnosis by one of us (P. D. W.) of effort syndrome in 146 cases and other diagnoses, principally of irritable heart and cardiac neurosis, in the remainder and (2) sufficient details about symptoms to substantiate the diagnosis of neurocirculatory asthenia. Patients were excluded when there was an additional disease or evidence of an additional disease recorded (blood pressure above 150 systolic and 90 diastolic was among the data considered to be evidence of an additional disease).

Table 1.—*Symptoms of Neurocirculatory Asthenia (Percentage of Each Symptom in 60 Patients and 102 Healthy Controls*

Symptoms	Patients	Controls*
Palpitation	96.7	8.8
Tires easily	95.0	18.6
Breathlessness	90.0	12.7
Nervousness	87.6	26.5
Chest pain	85.0	9.8
Sighing	79.3	15.7
Dizziness	78.3	15.7
Faintness	70.0	11.8
Apprehension	60.7	2.9
Headache	58.3	25.5
Paresthesias	58.2	7.2
Weakness	56.0	3.0
Trembling	53.5	16.7
Breath unsatisfactory	52.7	3.9
Insomnia	52.7	4.0
Unhappiness	50.0	2.1
Shakiness	46.5	15.7
Fatigued all the time	45.1	5.9
Sweating	44.9	33.0
Fear of death	41.8	2.0
Smothering	39.7	3.9
Syncope	36.7	10.8
Flushes	36.2	...
Yawning	34.6	14.0
Pain radiating to left arm	30.0	2.0
Vascular throbbing	29.0	1.1
Dry mouth	25.1	1.1
Nervous chill	24.4	...
Frequency	18.6	2.1
Nightmares	18.3	9.2
Vomiting and diarrhea	14.0	0.0
Anorexia	12.3	3.0
Panting	7.9	...
Paralysis	0.0	0.0
Blindness	0.0	0.0

* Healthy controls consisted of 50 men and 11 women from a large industrial plant and 41 healthy postpartum women from the Boston Lying-In Hospital.

Symptoms of neurocirculatory asthenia as defined for this study included breathing trouble and symptoms from two of the following three groups: (1) palpitation or chest pain; (2) nervousness, dizziness, faintness, attacks or spells, and (3) feelings of fatigue or tiredness or limitation of activity. The symptoms elicited from the patients who were examined in this follow-up study are listed in table 1 and compared with symptoms from 102 control subjects.

The patients' records were selected from office files (P. D. W.). The records of all patients who were examined before 1928 were reviewed. Of these, there were records of 173 patients which met the aforementioned criteria for the diagnosis of neurocircula-

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From the Cardiac Research Laboratory, Massachusetts General Hospital and the Departments of Medicine and Diseases of the Nervous System, Harvard Medical School.
Dr. Jane Worcester advised on statistical methods and Dr. Alex Langmuir on epidemiologic technics. Dr. Gilbert Beebe advised on Methods. Mrs. Rudolf Osgood, social worker, assisted in the follow-up and home visits to patients. The General Electric Company cooperated in the study of some of the control subjects.

1. Wheeler, E. O.; White, P. D.; Reed, E. W., and Cohen, M. E.: Familial Incidence of Neurocirculatory Asthenia ("Anxiety Neurosis," "Effort Syndrome"), J. Clin. Investigation **27**: 342, 1948.

2. (*a*) Cohen, M. E.; Consolazio, F. C., and Johnson, R. E.: Blood Lactate Response During Moderate Exercise in Neurocirculatory Asthenia, Anxiety Neurosis or Effort Syndrome, J. Clin. Investigation **26**: 339, 1947. Cohen, M. E.; Johnson, R. E.; Consolazio, F. C., and White, P. D.: Low Oxygen Consumption and Low Ventilatory Efficiency During Exhausting Work in Patients with Neurocirculatory Asthenia, Effort Syndrome, Anxiety Neurosis, J. Clin. Investigation **25**: 292, 1946. Chapman, W. P.; Cohen, M. E., and Cobb, S.: Measurements of Levels of Heat Stimulus Perceived as Painful and Producing Wince and Withdrawal Reactions in Patients with Neurocirculatory Asthenia, Anxiety Neurosis or Effort Syndrome and in Control Subjects, J. Clin. Investigation **25**: 890, 1946. (*b*) Cohen, M. E.; White, P. D., and Johnson, R. E.: Neurocirculatory Asthenia, Anxiety Neurosis or the Effort Syndrome, Arch. Int. Med. **81**: 260 (March) 1948.

tory asthenia uncomplicated by other disease, and all were used.

Location of Patients.—The patients were located through a number of sources and by various methods. These included search of telephone and street directories, alumni and professional lists, files of licenses (marriage and automobile) and records of divorce and death of forty-four states. In addition, physicians, friends, previous places of employment, insurance companies and credit bureaus were consulted; home addresses and neighbors were visited; police searched neighborhoods, and a notice was put in twenty newspapers and broadcast over six New England radio stations. By one or several of these measures 171 of the 173 patients were located. No patient was dropped from the study because he could not be located.

TABLE 2.—*One Hundred Seventy-Three Patients Followed up After Twenty Years*

Status	Number	Percentage
Located	171	98.8
Not located	2	1.2
Total	173	100.0
Located — 171		
Alive	153	89.5
Dead	18	10.5
Total	171	100.0
Alive — 153		
Examined	60	39.2
Questionnaire reply only	93	60.8
Total	153	100.0

Sample Selected.—One hundred and seventy-three patients were selected for follow-up study from a group of 2,799 private patients, mostly patients with heart disease, seen by one of us (P. D. W.) prior to 1928 (table 2). One hundred and seventy-one of these were located. Eighteen were dead. Only 2 patients were not located. Information was obtained from all the 153 livng patients; 60 were given a personal interview and examination, and 144 replied to questionnaires.

General Features of the Sample.—Table 3 lists some of the general information about the 173 patients, such as sex, age and interval between the original and follow-up studies. The whole sample is compared in these respects with the 93 patients reached only by questionnaire, the 60 patients who were examined and the 18 patients who died.

The 93 patients who were reached by questionnaire alone and the 60 patients who were examined did not show any significant differences statistically with respect to proportion of sexes, age or length of follow-up, either from each other or from the whole sample of 173 patients. The mean age of the 18 patients who died was greater at the time of their first visit (38.4 years) than the mean age of the whole sample (significance ratio, 3.8).

Type of Treatment.—These patients had no special treatment prior to their first visit. At the time of their first visit they received simple reassurance; thereafter their management varied. Eleven of the 60 patients who were examined had consulted a psychiatrist, but only 2 of these returned for more than a few visits. Vitamins, thyroid, sedatives or digitalis were used by some patients; others had no further treatment.

Sources of Data.—Information was obtained from personal interview and examination, questionnaire examination by mail or telephone and certified death certificates. Pertinent information was obtained from 151 of the 153 patients who were alive when located; 2 patients refused to answer questions about their health.

The personal interview and examination was limited to a group of patients living in the Boston area. It consisted of a history carefully recorded on a detailed form listing 115 questions, routine physical examination, electrocardiogram and fluoroscopic examination of the chest. This was designed to elicit the signs and symptoms of neurocirculatory asthenia and to learn about the course of the disorder, the present condition of the patient and the development of other diseases.

TABLE 3.—*General Features of the Sample*

Data	Total Group, 173	Questionnaire Alone, 93	Examined, 60	Dead, 18	Missing, 2
Men	33.5%	30.1%	36.7%	50.0%	0.0%
Women	66.5%	69.9%	63.3%	50.0%	100.0%
Age, first visit (mean)	32.0 yr.	31.7 yr.	31.9 yr.	38.4 yr.*	25.5 yr.
Age, last contact (mean)	53.9 yr.	53.8 yr.	54.0 yr.	52.0 yr.†	25.5 yr.
Length of follow-up (mean)	21.9 yr.	22.1 yr.	22.1 yr.	12.3 yr.	0.0 yr.
Age of onset, from original record (mean)	27.4 yr.	27.4 yr.	27.5 yr.	32.6 yr.	25.5 yr.

* The patients who died were significantly older at the time of the first visit than the rest of the patients (significance ratio, 3.8).
† Age at death.

To questionnaires were used. The first of these asked four questions: 1. "What were your symptoms at the time you saw Dr. White?" 2. "Have these symptoms bothered you since that time?" 3. "Have these symptoms hindered your ability to work at any time?" 4. "Do you consider your health to have been good, fair or poor since you saw Dr. White?" Answers were received from 144 of the 153 patients. A second questionnaire was sent out at the end of the study to obtain additional information about marriage, divorce, children, employment, illness, operations, hospitalizations, military service, occupation and income. At the time of writing answers had been received from 106 of the 153 patients to whom this second questionnaire had been sent.

Selection of Patients for Examination.—The first 60 patients who were located in the Boston area were asked to come to the Massachusetts General Hospital for a check-up, and 55 of these patients were examined. Five other patients were examined at their own request, so that a total of 60 patients was examined. Fifty-one of these 60 patients answered both questionnaires.

Representativeness of the 60 Patients Examined.—These patients were selected because they resided in or near Boston, were first in the alphabet, were the first to

reply and were willing to be examined. Of these factors, those which reasonably might affect this sample in regard to severity of neurocirculatory asthenia were permanence of residence and willingness to be examined.

Questionnaire data about health from the 5 patients who did not come in to be examined and from the 5 patients who were examined at their own request did not suggest any obvious differences.

The proportion of patients with good, fair and poor health, according to data from fifty-one questionnaires in the group of 60 patients examined, does not show significant statistical difference from those proportions of the whole group of 144 patients who answered the questionnaire (table 4).

On the basis of the aforementioned comparisons, it was concluded that these 60 patients were representative of the whole sample with respect to age, proportion of sexes, length of follow-up, age of onset and state of health. It was important to establish this representativeness because most was known about this group of 60.

Evaluation of the Course of Neurocirculatory Asthenia in the Patients Examined.—The 60 patients in this group were graded according to the symptoms from and disability due to neurocirculatory asthenia. They were placed in the following four categories:

TABLE 4.—*Percentage of Patients with Good, Fair or Poor Health During the Twenty Year Follow-Up Period*

State of Health	Total Questionnaire Replies, 144	Patients Questioned and Examined: Questionnaire Replies, 51	Patients Questioned and Examined: Examination Evaluation, 51	Total Examination Evaluation, 60
Good	60.6	56.9	41.2	43.0
Fair	32.4	39.2	49.0	43.3
Poor	7.0	3.9	9.8	11.7
Bothered	61.9	68.8	....	....
Not bothered	38.1	31.2	....	....
Hindered	27.6	24.5	....	....
Not hindered	72.4	75.5	....	....

Well: Patients defined as well had had no symptoms for the last five years the character or quantity of which were diagnostic of neurocirculatory asthenia as defined in this study (see definition) and had had no disability during this time. (Any patient who had, in the follow-up period, more than five symptoms commonly occurring in neurocirculatory asthenia, regardless of whether or not the distribution fulfilled the requirements of the definition used in this study, were considered to have persistent symptoms and were excluded from the well category. There were 4 such patients.)

Symptoms, No Disability: Patients in the second category had had symptoms during the last five years, the character and quantity of which were sufficient to meet the requirements of a diagnosis of neurocirculatory asthenia as defined in this study, but had had no disability.

Symptoms, Slight Disability: Patients in the third category, in addition to the characteristic symptoms of neurocirculatory asthenia as defined in this paper, had had continual or recurrent slight disability. Slight disability was defined as actual limitation of work, housekeeping or social life of a degree which did not interfere significantly with earning a living, family life or social activities. In addition, a belief by the patient that he had so limited these activities was also defined as slight disability.

Symptoms, Moderate or Severe Disability: Patients in the fourth category, in addition to the characteristic symptoms of neurocirculatory asthenia, had had constant or recurrent disability of moderate or severe degree. Moderate or severe disability was defined as actual limitation of work, housekeeping or social life, of such a degree as to interfere significantly with earning a living, family life or social activities. In addition, a belief by the patient that he had so limited these activities was also defined as moderate or severe disability.

The protocol of patients examined lists each patient's symptoms and examples of his disability (table 5).

Validity of the Questionnaire Information.—In order to determine whether or not the questionnaires were a valid means of evaluating the patients' health, that is, whether or not they agreed with conclusions about the patients' health derived from the examination data, a comparison was made of the patients' estimate of their own health and the examiner's estimate of the patients' health. Answers to the following questions were tabulated from the examination data for each of the 60 patients: 1. Have symptoms persisted? 2. Have symptoms occurred frequently? 3. Have symptoms been present continuously? 4. Has there been any disability? 5. Has there been moderate to severe disability? 6. Have social activities been restricted? 7. Have doctors been consulted frequently? 8. Has a psychiatrist ever been consulted? 9. Has life been unhappy? A patient was defined as being in good health when there were less than 33.3 per cent positive replies, fair health when there were 33.3 per cent to 66.7 per cent positive replies and poor health when there were more than 66.7 per cent positive replies. This method gave evaluations which were comparable to the clinical impression of the examiners. This estimate of the patients' health from the examination data was compared with the patients' estimate of their own health (table 4). The comparison indicates that the two methods give statistically similar results and that the questionnaire answers can be used as a valid measure of the patients' health.

Method of Calculating Expected Mortality.—The mortality in this group was compared with the mortality in the following population samples: (1) general population of Massachusetts and of the United States, (2) insured persons and (3) persons living in Hagerstown, Md.

In order to compare the mortality in this group with that of the general population, we calculated the number of patients who might have been expected to die had they been subject to the same mortality rate as the general population according to the person-years (Lx) method,[3] using mortality rates for the census years 1920, 1930 and 1940[4] and for the noncensus year 1947.[5] We also calculated the expected deaths omitting the first five years of the follow-up period in order to exclude from consideration the factor that patients examined and found free of disease other than neurocirculatory asthenia might show for five years thereafter a slightly lower mortality rate than that shown by the general population.[6]

3. Puffer, R. R.: Familial Susceptibility to Tuberculosis, Cambridge, Mass., Harvard University Press, 1946, p. 88.
4. Linder, F. E., and Grove, R. D.: Vital Statistics Rates in the United States, United States Government Printing Office, 1943, p. 164.
5. Deaths by Age: United States 1947, Federal Security Agency, Public Health Service, 1949.
6. Britten, R. H.: Effect on Life Insurance Mortality Rates of Rejection of Applicants on the Basis of Medical Examination, Pub. Health Rep. 46: 46, 1931.

TABLE 5.—*Protocol of Patients Examined*

Sex	Age	A Original Symptoms Disappeared	B Original Symptoms Persisted	C Newly Recorded Symptoms	Disability
Group I, Well (7 Patients)					
M	69	1, 2, 5, 6, 7, 8	.....	3, 11	None
F	32	1, 2, 3, 5, 6, 30, 39	14, 21	12	None
F	46	2, 5	1	8, 26	None
M	54	1, 2, 8, 14, 38	6	3, 17, 27	None
F	47	5, 6, 8, 26	1, 2	7, 12	None
F	55	1, 5, 14	2, 16, 21	39	None
M	70	8, 14	5	.....	None
Group II, Symptoms, No Disability (21 Patients)					
F	35	.....	1, 2, 5, 8	3, 4, 6, 7, 15, 17, 18	None
M	46	18	1, 5, 8	2, 4, 9, 11, 33	None
M	53	5, 6, 14	1, 2, 8	3, 4, 15, 16, 22, 26, 34	None
M	54	5, 8, 18	1, 3, 6, 19, 21	4, 7, 9, 11, 14, 15, 16	None
F	50	1, 10	2	8, 11, 17, 19, 34	None
F	69	16	1, 2, 3, 4, 6, 8, 10	5, 7, 15, 18, 19, 20, 22	None
M	51	5, 10	2, 8	6, 7, 14, 17, 24	None
M	52	7, 14	1, 3, 8, 16	2, 5, 9, 12, 13, 26, 27, 29	None
M	62	3, 9	2, 4, 6	8, 16, 17, 19	None
F	30	5, 8, 33	1, 2, 4	3, 6, 7, 12, 13, 14, 17, 18, 22, 34	None
M	55	1	2, 3, 4, 6	9, 10, 11, 14, 17, 21	None
F	41	6	4, 5, 8, 11	1, 2, 3, 9, 12, 13, 19, 21, 23, 34	None
F	39	10, 18	1, 4, 5, 8, 14	4, 6, 7, 11, 12, 13, 15, 21	None
M	39	5	1, 2, 4	2, 9, 10, 11, 12, 13, 14, 16, 21	None
F	55	4, 5, 8	1, 2, 3, 6	10, 12, 14, 18	None
M	48	.....	1, 9	3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 23, 25	None
F	60	14, 16	1, 2, 3, 5, 6, 8	4, 7, 10, 12, 13, 21, 27, 29, 34	None
M	46	5	1, 6, 14	2, 3, 4, 7, 11, 12, 13, 23, 24	None
F	46	.....	1, 2, 3, 4, 5, 6, 8, 9, 11, 14	13, 18, 19, 21, 22, 23, 25, 29, 34	None
F	32	2, 9	1, 5, 6, 14	9, 10, 18, 22, 34	None
F	37	.....	1, 2, 3, 5, 8, 18	4, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 19, 24, 27, 34	None
Group III, Symptoms, Mild Disability (23 Patients)					
M	51	5, 6, 33	1, 2, 3, 4	6, 7, 10, 15, 17, 18, 25, 27, 34	Changed work because of symptoms
F	55	4, 6, 12, 18	1, 2, 3, 5, 9, 14	10, 22, 24, 31, 34	Symptoms have affected housework of late; doctor told her to "take life easy"
F	63	2, 3, 18, 33	1, 5, 8	4, 10, 11, 19, 21, 32	Gave up night teaching
F	62	2, 3, 9, 14, 16, 18, 27	1, 4, 6, 8	5, 11, 19, 22, 28, 30	Never could do hard work; was extremely careful; illness affected work in that she works slowly
F	39	18	1, 2, 5, 8, 16	3, 4, 7, 9, 10, 12, 13, 15, 19, 23, 24, 34	Would have done more outside her home; ". . . it has been a handicap. . . ."
F	47	17	1, 4, 5, 6, 8, 13, 14	2, 3, 7, 9, 10, 11, 15, 19, 21, 22, 24, 26, 28, 34	". . . would have done more always. . . ."
F	43	5, 6, 8	1, 2, 4, 19	3, 7, 9, 10, 11, 12, 13, 16, 20, 25, 27	Needs to lie down once a day and to go to bed early
M	47	1, 6, 14	2, 3, 4, 5, 9	7, 11, 12, 13, 17, 18, 20, 21, 30, 34	Illness altered life plan; would have traveled more in business
Group III, Symptoms, Mild Disability (23 Patients)					
F	44	6, 14	1, 2, 3, 4, 5, 8, 10	9, 12, 13, 18, 29	Illness affected work and altered life plan; impaired productivity and activity
F	70	1, 26	2, 3, 5, 8	4, 6, 10, 11, 14, 16, 21, 23, 24, 34	Stopped nursing to become a companion; goes upstairs only once a day; never could go into crowds
F	59	14, 24, 29	1, 2, 4, 5, 6, 9	3, 7, 10, 11, 12, 13, 16, 17, 19, 22, 23, 25, 27, 34	Never could do hard work; illness affected work and life plan
M	70	11, 14, 27, 29	1, 2, 4, 5, 6, 8, 24	7, 10, 15, 18, 25, 29, 35	Never could do hard work; illness affected work, impaired activity and productivity
M	52	1, 2, 4, 5	6, 26	3, 7, 15, 20, 34	Cannot ride subway; wife drives him to work
F	46	.....	3, 6, 8, 9, 14, 18, 23	1, 2, 7, 12, 13, 15, 16, 20, 26	Never could do hard work
M	35	14	1, 2, 3, 5, 8	6, 7, 9, 10, 15, 18, 19, 20, 21, 24, 25	Illness altered life plan, affected work at one time; impaired productivity and activity
F	45	9, 21, 22, 24	1, 2, 3, 4, 5, 6, 8, 12, 14, 17, 18, 23	25, 26	Illness affected work, impaired productivity and activity
F	60	3, 5, 16	1, 2	6, 7, 8, 15, 20, 24, 31	A year ago, in bed 4 weeks; 7 years ago, in bed 1 month; impaired productivity and activity
M	60	14	1, 8	3, 4, 7, 8, 10, 16, 23	When tired, takes a day to go hunting; illness affected work in 1915, rested a few days
F	56	1, 8, 14	2, 3, 5, 6, 16	9, 21, 34	Illness affected work at one time
F	59	12, 18	1, 5	2, 3, 4, 6, 7, 8, 9, 11, 15, 16, 17, 19, 20, 21, 22, 24, 28, 31, 34	Gave up writing, resumed it recently; never could do hard work; illness affected life work, impaired activity and productivity; rested in a New England sanatorium in 1929, 1941 and 1946
F	45	10	1, 2, 5	3, 4, 8, 9, 11, 25, 39	Impaired productivity and activity; ". . . doesn't do as much. . . ."
M	50	14, 24	1, 4, 18	2, 5	Illness affected life plan and work at one time; must have sleep; whole life built on saving energy; rarely goes out at night
F	60	.....	1, 2, 5, 8, 14	3, 4, 6, 7, 9, 10, 11, 12, 15, 15, 17, 18, 19, 20, 23, 24, 27, 28, 29, 31, 34	Illness affected life plan and work at one time; impaired productivity and activity
Group IV, Symptoms, Moderate or Severe Disability (9 Patients)					
F	62	8, 9, 14	1, 2, 3, 4, 5, 6, 19	11, 12, 13, 16, 17, 18, 20, 22, 23, 24, 25, 28, 31	Believes she could have done more; impaired productivity and activity; never could do hard work, can do little without rest; constantly tired, in bed much of the time

TABLE 5.—*Protocol of Patients Examined—Continued*

Sex	Age	A Original Symptoms Disappeared	B Original Symptoms Persisted	C Newly Recorded Symptoms	Disability
Group IV, Symptoms, Moderate or Severe Disability (9 Patients)					
F	62	2, 16	1, 5, 8, 9, 12, 14, 27	3, 7, 11, 13, 15, 17, 19, 20, 21, 23, 26, 32, 33, 34	Illness affected work at one time, "hysterical seizure"; ill in bed after divorce petition was dismissed; 3 weeks in a private sanatorium with heart pain in 1933; rested on many occasions; in bed often for short periods
F	52	.....	1, 2, 5, 6, 9, 12, 17	3, 4, 6, 7, 10, 13, 14, 15, 18, 19, 21, 24, 25, 26, 29, 33, 34	Never could do hard work; illness affected work and altered life plan; impaired productivity and activity; never walks with friends because they walk too fast; stays away from close places
M	60	14, 18	2, 5, 8, 10	1, 3, 4, 6, 7, 11, 12, 15, 16, 17, 19, 20, 23, 24, 28, 29, 31, 34	On compensation; has not worked since World War I
F	52	.....	1, 2, 3, 5, 6, 8, 14, 21	4, 7, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 24, 26, 28, 34	Illness affected work; thinks she tires more easily than other women; 1939, in bed 1 week; 1942, in bed 6 weeks; 1945, in bed 3 weeks
Group IV, Symptoms, Moderate or Severe Disability (9 Patients)					
F	63	6, 12, 17	1, 2, 5, 8, 14, 22	3, 4, 7, 9, 10, 11, 15, 16, 18, 19, 20, 23, 24, 26, 28, 34	Must rest every few months, then takes another job; never could do hard work; illness affected work and altered life plan; impaired productivity and activity; in a New England sanatorium 6 weeks in 1944
F	56	.....	1, 2, 14	3, 5, 9, 10, 16	Never could do hard work; stopped teaching music; would have done more; impaired productivity and activity; nervous breakdown at age 22; stopped work for a year
M	56	.....	1, 2, 5, 8, 10	3, 4, 6, 7, 11, 12, 13, 14, 15, 16, 17, 19, 21, 23, 24, 26, 28, 34	On 100% compensation; retired in 1936; illness affected life work; never could do hard work
F	58	.....	1, 2, 5, 6, 7, 8, 9, 10, 11, 14, 17, 31	3, 12, 13, 15, 16, 18, 19, 22, 23, 24, 25, 32, 34	Never could do hard work; illness affected work; could not take a full time job; altered life plan, impaired activity and productivity

This table lists, for the 60 patients who were examined, the sex, age, symptoms recorded on the original record, symptoms recorded at the time of the follow-up examination and disability during the follow-up of each. The patients are classified in the four groups described under Methods and Technics. Symptoms listed in column *A* are those which were present at the original examination but which were absent at the follow-up examination, or those which disappeared. Column *B* lists symptoms which were present at the original examination and at the follow-up examination, or those which persisted. In column *C* are listed symptoms not recorded or recorded as negative at the original examination which were present at the follow-up examination. Column *A* plus *B* lists all the symptoms on the original record, *B* plus *C* all the symptoms on the follow-up examination and *A* plus *B* plus *C* all the symptoms in the whole course of the disorder. The numbers under the *A*, *B* and *C* columns refer to the following list of symptoms:

1. Palpitation
2. Tires easily
3. Nervousness
4. Sighing
5. Breathlessness
6. Dizziness
7. Apprehension
8. Chest pain
9. Headache
10. Paresthesias
11. Breathing unsatisfactory
12. Trembling
13. Shakiness
14. Faintness
15. Fear of death
16. Insomnia
17. Sweating
18. Weakness
19. Smothering
20. Unhappiness
21. Syncope
22. Flushes
23. Yawning
24. Tired all the time
25. Vascular throbbing
26. Pain radiating to left arm
27. Dry mouth
28. Nervous chill
29. Frequency
30. Vomiting and diarrhea
31. Nightmares
32. Panting
33. Anorexia
34. Crowd trouble
35. Paralysis
36. Blindness

We also calculated the number of expected deaths using mortality rates for insured persons.[7] These rates are based on dollars of insurance and claims rather than on individual persons. These insured persons had, at the time of their original insurance examination, no disease considered to be an insurance liability; neither did the patients in this study.

Finally, we calculated the expected number of deaths using mortality rates from a twenty year follow-up study of well persons in Hagerstown, Md.[8] This study gave mortality rates for a group of persons believed to be well, who were followed after twenty years.

In each instance, the number of expected deaths was compared with the number of observed deaths and the statistical significance of the differences calculated.

Method of Calculating Expected Number of Patients with Hypertension.—We calculated the expected number of patients with hypertension in the same manner as we calculated the expected mortality, using an Lx, or person-years, table for the 60 patients examined. The expected number of patients with hypertension was calculated from rates for incidence of hypertension in Army officers, according to Levy, White, Stroud and Hillman.[9]

Statistical Methods.—Standard statistical methods were used in analyzing the data and their statistical significance. The following technics were used: standard error of the difference between means[10]; standard error of the difference between proportions,[11] and chi square with correction of Yates for small numbers.[10] The odds represented by various significance ratios were from Pearl,[11] and squares and square roots were from Barlow's tables.[12]

RESULTS

The results of the follow-up study of the 173 patients were analyzed, first, with respect to the course of neurocirculatory asthenia in the 153 patients who were examined or who responded to questionnaires, second, with respect to the other diseases which developed in the 60 patients examined and, third, with respect to the number of deaths and their causes.

The Course of Neurocirculatory Asthenia.—Data from the 60 Patients Examined: Data evaluating the health of the 60 patients who were examined are tabulated in table 6. The evaluation was based on the patients' symptoms and disability during the twenty

7. Marks, H. H.: Personal communication to the authors.
8. Lawrence, P. S.: An Estimate of the Incidence of Chronic Disease, Pub. Health Rep. **63**:1 69, 1948.
9. Levy, R. L.; White, P. D.; Stroud, W. D., and Hillman, C. C.: Sustained Hypertension, J. A. M. A. **135**:77 (Sept. 13) 1947.
10. Hill, A. B.: Principles of Medical Statistics, The Lancet, Ltd., London, 1948.
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year period since their first examination as well as their health at the time of the follow-up examination, and it places them in four groups, as previously defined.

Of the 60 patients examined, 7, or 11.7 per cent, were well. Four of these patients had had only one episode of neurocirculatory asthenia, lasting a few months to three years. The other 3 had had two or three episodes of neurocirculatory asthenia. None of these patients had an original diagnosis of "postinfectious" effort syndrome, and the original records of these patients did not differ from the rest of the group with respect to age of first visit, sex distribution or number of symptoms. In 88.3 per cent of the 60 patients, the symptoms of neurocirculatory asthenia had continued. With one exception these patients were never free of symptoms for any prolonged period (over a year), though the number, frequency and severity of the symptoms varied considerably from time to time. Of these 60 patients, 73.3 per cent had symptoms, but no disability or only mild disability. Nine patients, or 15.0 per cent, had symptoms and a moderate to severe degree of disability. Of these last patients, 7 were women and 2 were men. The 2 men, both veterans of World War I, were pensioners of the Veterans Administration.

Data from the First Questionnaire (State of Health): Less detailed information about the patients' health was available from the answers to the first, or state of health, questionnaire. Of the 144 patients who answered this questionnaire (table 4), 60.6 per cent thought that their health had been good during the follow-up period; 32.4 per cent thought it had been fair and 7.0 per cent thought it had been poor. Symptoms had continued to bother 61.9 per cent and had hindered work in 27.6 per cent. An evaluation, in the terms good, fair and poor, of the health of the 60 patients who were examined was made from the interview data as was previously described. In the case of the 51 patients who were examined and who also answered this questionnaire (table 4), this evaluation was in close agreement with their own evaluation of their health.

The health of the men has been compared with that of the women. This comparison is based on data from questionnaires and the examinations of 151 patients in this study. The health of the men was good in 64.6 per cent of the cases, fair in 27.1 per cent and poor in 8.3 per cent. That of the women was good in 49.5 per cent of the cases, fair in 39.8 per cent and poor in 10.7 per cent. These data for men and women did not have a significant statistical difference. Of the 11 patients who had consulted a psychiatrist, 45.4 per cent were in good health, 27.3 per cent in fair health and 27.3 per cent in poor health, which showed that the state of their health was similar to that of the rest of the patients.

General Factors Relating to the Patient's Social Adjustment and Health: Data about marriage, divorce, children, employment, income, hospitalizations and surgical operations were obtained from the patients who were examined and from those who answered the second questionnaire, which concerned personal data. These data are listed in table 7. Of 112 patients, 76.8 per cent were married or widowed, 21.3 per cent were single and 1.9 per cent were divorced at the time of the follow-up examination. Of the 88 married patients, 80.7 per cent had children. The mean number of children per family was 2.1. Of the women, 22.1 per cent were employed outside their own homes; of the men, 94.1 per cent were working, none holding jobs requiring heavy muscular labor.

Information from an optional question about income was made available by 69 patients. At the time of the first visit twenty or more years ago, the largest number of patients had an annual income between $1,000 and $2,500. At the time of the follow-up study, the largest number had an annual income between $2,500 and $5,000. Five patients were receiving an income of more than $10,000 at the time of the original examination, while 15 patients were receiving more than this amount at the time of the follow-up study.

Data were available about hospitalizations and surgical operations from 33 men and 72 women with neurocirculatory asthenia. The mean number of hospitali-

TABLE 6.—*Findings of Follow-Up Study: Symptoms and Disability from Neurocirculatory Asthenia During Twenty Years*

Symptoms and Disability	60 Patients		22 Men		38 Women	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Well	7	11.7	3	13.6	4	10.5
Symptoms, no disability	21	35.0	10	45.5	11	29.0
Symptoms, mild disability	22	36.3	7	31.8	16	42.1
Symptoms, moderate or severe disability	9	15.0	2	9.1	7	18.4

TABLE 7.—*Marriage, Offspring, Employment, Income, Hospitalizations and Surgical Operations of Patients with Neurocirculatory Asthenia*

Marital status (112)	**Per Cent**
Single	21.3
Married	76.8
Divorced	1.9
Children in families (88)	
Families with children	80.7
Families without children	19.3
Employment (34 men, 77 women)	
Men employed	94.1
Women employed	22.1
Income, dollars per person (69)	**Amount**
Mode, first visit	$1,000-$2,500
Mode, second visit	$2,500-$5,000
Hospitalizations per person (33 men, 72 women)	**Mean No.**
Men	1.6
Women	2.3
Operations per person (33 men, 72 women)	
Men	0.93
Women	1.53

zations was 1.6 for men, or 29.3 per 1,000 person-years, which is significantly lower than the 64.2 hospitalizations per 1,000 person-years found in 39 healthy male controls (significance ratio, 3.6). The mean number of hospitalizations for women was 2.3, or 41.3 per 1,000 person-years, which does not differ significantly from the 35.1 hospitalizations per 1,000 person-years for 50 normal female controls (significance ratio, 1.02).

The mean number of major surgical operations was 0.93 for men, or 20.7 per 1,000 person-years. This is significantly lower than the 39.2 operations per 1,000 person-years in 39 healthy controls (significance ratio, 3.1). For women, the mean number of operations was 1.5, or 32.8 per 1,000 person-years, which did not differ significantly from the figure of 34.9 operations per 1,000 person-years for the 50 healthy controls (significance ratio, 0.23).

There was no completely relevant control information for the nonmedical data. The control group for hospitalizations and surgical operations in men included a preponderance of healthy soldiers, and the high incidence in the control group may reflect that. The data lead to the impression that, although many of the symptoms of neurocirculatory asthenia persist, the disorder does not significantly interfere with marrying, raising a family or earning a living and does not lead to hospitalizations or major surgical operations.

Comparison with Other Reports: An attempt has been made to compare the health of these patients, who had reassurance and little else, with that of other reported patients who had various types of management (table 8). Those reports give data for patients with a diagnosis of anxiety neurosis or neurasthenia, synonyms for neurocirculatory asthenia. The patients in those reports may be placed in four groups: (1) well, without symptoms, (2) much improved, (3) slightly improved and (4) no change or worse, which may be compared with the four categories used in this study.

TABLE 8.—*Evaluation of Treatment: Condition of Patients With Neurocirculatory Asthenia From This Twenty Year Follow-Up Study Compared with That of Other Reports*

Status	This Study, 20 Yr. Follow-Up of 60 Cases, Per Cent	Sanatorium Plus Psychotherapy 1-30 Yr. Follow-Up [13] of 628 Cases, Per Cent	Psychoanalysis [14] of 24 Cases, Per Cent *	Outpatient Psychotherapy: 3 Year Follow-Up [15] of 214 Cases, Per Cent	Outpatient Psychotherapy: End of Treatment [16] of 24 Cases, Per Cent
Well	11.7	8.3	16.7	34.6	12.5
Symptoms, no disability, much improved	55.0	38.5	54.9	31.3	29.9
Symptoms, mild disability, slightly improved	28.3	45.2	16.7	5.1	25.0
Symptoms, moderate or severe, disability, no change, worse	15.0	10.0	12.4	29.0	33.3

* Seven patients who failed to complete at least six months of analysis and who were termed "therapeutic failures" are omitted.

TABLE 9.—*Civilians vs. Veterans: Poor Health Due to Neurocirculatory Asthenia*

Diagnosis made while	Number Patients	Per Cent in Poor Health
Civilians		
This study, 20 year follow-up	51	0.0
Soldiers		
British, 5 year follow-up [23]	556	50.6
Australian, 20 year follow-up [23]	120	35.0
This study, 20 year follow-up	7	71.4

The report of Luff and Garrod,[13] a three year follow-up study of patients treated in an outpatient clinic with psychotherapy, showed that 34.6 per cent of 214 patients were without symptoms at the end of three years (a group classified by them as "much improved," in contrast to 11.7 per cent of the patients of this study. On the other hand, 29 per cent of their patients were unchanged or worse, whereas only 15 per cent of the patients in this study showed moderate to severe disability. The results of their study have a significant statistical difference from our results (odds greater than 1,000 to 1). A significantly greater number of their patients were in the group with poor health and a significantly greater number were in the group classified as well, rendering equivocal the question of which group of patients showed a better course.

Neustatter,[14] reporting on the condition of 24 patients at the end of treatment consisting of outpatient psychotherapy, had 33.3 per cent unchanged or worse, in contrast to 15.0 per cent in this study. Striking differences are not seen in the other categories. The number of cases in his study is too small for useful statistical comparison.

The results of psychoanalytic procedure in patients with anxiety neurosis and neurasthenia have been compiled by Knight,[15] who included reports from the Berlin Institute, the London Clinic, the Menninger Clinic and Hyman and Kessel. His calculations, in which patients who did not complete at least six months of psychoanalysis are omitted and referred to as "therapeutic failures," place 16.7 per cent of the total 24 patients in the "well, no symptoms" category and 12.4 per cent in the "no change or worse" group, figures similar to those obtained in this study. Again, the number of patients treated is too small for useful statistical comparison.

In a fourth study, Coon and Raymond[16] have reported on a one to twenty year follow-up study of 678 patients treated with psychotherapy in a sanatorium. Their results are similar to those of this study, 8.3 per cent of the patients being well without symptoms and 10.0 per cent unchanged or worse. The results do not have a significant statistical difference from the results of this study (odds less than 20:1).

The literature contains reports of various methods of treatment of patients considered to have effort syndrome, neurocirculatory asthenia, anxiety neurosis or anxiety states, or of patients with similar symptoms, diagnosed as psychoneurosis. Examples of such treatment include the use of ammonium chloride, hydrochloric acid and sedatives,[17] electric convulsive procedure,[18] frontal lobotomy,[19] papaverine,[20] insulin injections,[21] adrenal gland denervation[22] and ergotamine tartrate and ergonovine maleate.[23] The results reported in the articles when comparable data are presented do not differ significantly from those reported for psychotherapy. In most reports the cases are too few or the data are lacking to permit evaluation of these results.

Thus there is no consistent published evidence from these reports to indicate that prolonged psychotherapy or any other procedure produces strikingly better results in the treatment of patients with neurocirculatory asthenia than does a procedure involving mainly simple reassurance and the passage of time.

However, even if these studies showed that patients treated by various means fared better or worse than

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14. Neustatter, W. L.: Results of Fifty Cases Treated by Psychotherapy, Lancet **1**:796, 1935.

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17. Soley, M. H., and Shock, N. W.: The Etiology of Effort Syndrome, Am. J. M. Sc. **196**:840, 1938.

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19. Freeman, W., and Watts, J. W.: Psychosurgery, Springfield, Ill., Charles C. Thomas, Publisher, 1942, chap. 22.

20. Tyburst, J. S.: Papaverine in the Treatment of Neurotic Symptoms, Canad. M. A. J. **57**:25, 1947.

21. Martin, G. J.: Sedative Insulin Treatment of Anxiety in the Anxiety Neuroses, J. Nerv. & Ment. Dis. **109**:347, 1949.

22. Crile, G.: Indications for, and End-Results in Three Hundred and Eight Denervations of the Adrenal Glands, Am. J. Surg. **24**:378, 1934.

23. Kelley, D. McG.: The Use of Ergotamine Compounds in the Treatment of Acute Simple Anxiety State, Am. J. Psychiat. **104**:608, 1948.

the patients in this study, a final conclusion concerning the relative value of various treatments would not be warranted, since the studies are not clearly identical in the following respects: (1) criteria for diagnosis, (2) severity of the disorder, (3) methods of evaluating recovery or improvement, (4) duration of follow-up and (5) proportion of the sample studied. This is not to say that a conclusive study comparing the results of various methods of treating neurocirculatory asthenia (anxiety neurosis, effort syndrome, neurasthenia) cannot be done, but thus far no conclusive study of therapy, including this one, has been done.

It was of interest to compare the severity of the course of neurocirculatory asthenia in patients whose disorder commenced while they were soldiers with that of patients whose disorder commenced while they were civilians (table 9). Grant [24] reports a five year follow-up of 556 British veterans with effort syndrome after World War I, of whom 50.6 per cent were unchanged or worse. Wishaw [25] in 1939 reported on the health of 130 Australian veterans of World War I that the blood pressure in each case had been 150 systolic and 90 diastolic or below. Blood pressures were taken in the office or home, with no specially controlled technic.

Heart disease was present in 10.0 per cent of the 60 patients examined, coronary heart disease being found in 3 patients, hypertensive heart disease in 2 patients and aortic stenosis in 1 patient. Two studies, one of industrial workers [26] and the second of insurance policy holders,[27] of men between the ages of 45 and 54 years, showed a prevalence of heart disease of 12.8 per cent and 12.4 per cent, respectively. A study of women insurance policy holders between these ages showed a prevalence of 19.8 per cent.[28] Cerebrovascular accidents leaving residual neurologic changes had occurred in 2 patients, or 3.3 per cent of the 60 patients examined.

Arthritis with obvious joint deformity was present in 2 patients, or 3.3 per cent. In one instance it was thought to be rheumatoid arthritis and in the other, either rheumatoid or hypertrophic arthritis.

TABLE 10.—*Prevalence of Hypertension in Patients with Neurocirculatory Asthenia Compared with Relevant Population Groups*

Author	Source	Number Persons	Age	Criteria *	Percentage of Group with Hypertension: Neurocirculatory Asthenia	Percentage of Group with Hypertension: Control
Master, Marks, Dack [214]	Workers, aged and hospital patients	14,849	40+	150 systolic and 90 diastolic and above	44.6	37.0
Friedman, Moschkowitz, Marrus [215]	Consecutive surgical patients	1,006	40+	Diastolic 100 and above; diastolic 90 and above and systolic 150 and above	35.0	22.2
Robinson, Brucer [217]	Insurance policy holders	4,326	40+	Diastolic above 90	9.9	13.5
				Systolic above 140	14.4	42.5
Hines [218]	Mayo Clinic, 20 year follow-up study	799	Average 55-60	Systolic above 160 and diastolic above 100; original reading 20 years ago, systolic below 160 and diastolic below 100	23.5	3.3
Hines [218]	Mayo Clinic, 20 year follow-up study	753 644	Average 55-60	Diastolic above 100, original reading 20 years ago below 90	12.7	3.3
				Systolic above 160, original reading 20 years ago below 130	20.9	15.5

* In each comparison the criteria for blood pressure and age used in the control group are applied to the patients with neurocirculatory asthenia.

with effort syndrome. Of these, 35 per cent were not working. Of the 7 men in this study whose disorder began while they were soldiers in World War I, 71.4 per cent were in poor health, in contrast to the 51 men whose disorder began while they were civilians, none of whom were in poor health. These reports do not clearly indicate whether or not the veterans were receiving pensions or compensation or the possible relation of this factor to reported poor health.

These data suggest that veterans with neurocirculatory asthenia do not get along as well as civilians with the same disorder; however, other factors, such as nationality, social and income group and differences in follow-up technics, make further study necessary.

Development of Other Diseases.—Information concerning the development of diseases other than neurocirculatory asthenia was available from the 60 patients who were examined, subject to the limitations of the examination (history, physical examination, electrocardiogram and fluoroscopic examination of the chest). It should be emphasized that, except for neurocirculatory asthenia, these patients were thought to be well when they were examined twenty years previously and

Two patients (3.3 per cent) gave a typical history of peptic ulcer which had in the past been confirmed by roentgenographic examination. Routine gastrointestinal roentgenographic studies were not done at the time of the follow-up examination. Of employees of the Metropolitan Life Insurance Company over the age of 30 years, 2.4 per cent had a peptic ulcer confirmed by roentgenogram over a ten year period.[29]

Diabetes mellitus or asthma was reported by 1.7 per cent of the patients. Routine tests of the urine for glycosuria were not done at this examination. The prevalence of diabetes in Oxford, Mass., as determined by urine and blood tests was found to be 3.6 per cent in persons between the ages of 35 and 64.[30] Of these persons 57.1 per cent had been previously known to have diabetes, which would make a prevalence of 2.0 per cent on the basis of history alone.

24. Grant, R. T.: Observations on the After Histories of Men Suffering from the Effort Syndrome, Heart **12**:121, 1925-1926.
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30. Wilkerson, H. L. C., and Krall, L. P.: Diabetes in New England Town: Study of 3,516 Persons in Oxford, Mass., J. A. M. A. **128**:209 (Sept. 27) 1947.

In table 10, the prevalence of hypertension as reported in the literature [31] was compared with that in this group. In each instance the prevalence of hypertension in this group was calculated on the basis of the criteria used in the particular group with which a comparison was made. Four groups showed a greater prevalence of hypertension and one a lesser prevalence of hypertension than this group. None of these groups were strictly comparable to the patients in our follow-up study.

Levy, White, Stroud and Hillman [9] reported on the development of hypertension in Army officers known to have had normal blood pressure at the time they entered the Army. A sustained blood pressure greater than 150 systolic and 90 diastolic was called hypertension. Applying their rates for the incidence of hypertension in various age groups to an Lx table for the 60 neurocirculatory asthenia patients examined in this study, we calculated the expected number of hypertensive patients to be 10.38; the actual number was 13. This difference was not statistically significant (significance ratio, 0.6). The application of these rates for male Army officers to this group, composed of both men and women, is reasonable since the prevalence of hypertension in women is generally considered to be equal to, or slightly greater than, that in men over the age of 40 years.[31a]

There is then no evidence that hypertension developed in patients with neurocirculatory asthenia more or less frequently than it would in a general population group.

No other medical diseases were noted in these patients. Control data about the diseases which developed in persons who were known to be healthy twenty years previously were not available. However, there does not appear to be a striking prevalence of any particular disease as estimated from comparison with prevalence as reported in the literature. Other psychiatric diseases, such as hysteria, obsessive-compulsive neurosis, manic-depressive psychosis or schizophrenia, were not observed in any of the 60 patients examined.

TABLE 11.—*Mortality in Neurocirculatory Asthenia: Actual Number of Deaths Compared with Expected Number of Deaths Calculated from Various Mortality Rates*

Source of Control Data	Expected Deaths *	Actual Deaths	Significance Ratio of Difference Between Actual and Expected Deaths
Vital statistics table, 1920 †	43.63	18.00	3.94
Vital statistics table, 1930 †	36.78	18.00	3.10
Vital statistics table, 1940 †	21.83	18.00	2.45
Vital statistics table, 1947 †	26.24	18.00	1.64
Vital statistics tables, 1920-1947 [32]	34.62	18.00	2.83
Vital statistics tables, 1920-1947, omitting first five years [32]	30.19	15.00	2.76
Insured persons, based on policy dollars †	23.96	18.00	1.22
Hagerstown 20 year follow-up of well persons * †	31.26	18.00	2.04

* The expected deaths were calculated from age specific mortality rates by use of Lx table methods.[3]

† Calculations based on unpublished data from Dr. P. S. Lawrence giving death rates by sexes decrease the expected number of deaths to 29.70 (significance ratio, 1.49).

Deaths among Patients, Number and Cause.—Eighteen of the 173 patients were dead at the time the follow-up study was done. Certified death certificates were obtained for each of these patients and were coded [32] by the Bureau of Vital Statistics, Secretary's Office, State House, Boston, Mass. The following questions about this group are of interest: Did more patients die than should have? Was there an excessive number of deaths from any special disease?

The number of deaths in this group has been compared with the expected number of deaths had these patients been exposed to the same risk of dying as (1) the general population, (2) insured persons and (3) persons living in Hagerstown, Md. (table 11). According to mortality rates for 1920 to 1947 for the general population [32] the expected number of deaths was 34.62. This differs significantly from the actual number of deaths, which was 18 (significance ratio, 2.83). Even if the 2 unlocated patients are assumed to be dead, raising the observed number of deaths to 20, the difference remains significant (significance ratio, 2.49).

We calculated the number of expected deaths omitting the first five year period of the follow-up in order to determine whether or not the low mortality as compared with that of the general population was a consequence of the exclusion of sick persons from the study as a result of the original examination.[6] The number of calculated expected deaths fell to 30.19. The number of calculated observed deaths fell to 15. This difference is significant (significance ratio, 2.76). This suggests that the exclusion of patients with other disease by the original medical examination was not the explanation of the low mortality observed.

When mortality rates for insured persons were used,[7] the expected number of deaths was 23.96, which was not significantly different from the observed number of 18 (significance ratio, 1.22). Denker,[34] from a study of insured persons who were termed neurotic, reported that they not only had a lower mortality than did the general population but also had a lower mortality than the rest of the insured group.

We calculated the expected deaths using mortality rates for persons from Hagerstown, Md., who were thought to be well in 1923 and who were followed after a period of twenty years.[6] The expected number of deaths according to these mortality rates was 31.26, which is not significantly greater than the actual number, 18 (significance ratio, 2.04). The Hagerstown group is probably of lower economic and cultural level than is this group.

A relevant calculation which did not suggest a significantly low death rate was that based on insured persons. It is concluded that no more patients with neurocirculatory asthenia died than might have been expected and that the evidence suggests that, if anything, fewer deaths occurred than might have been expected. The differences in economic and social level must be considered as one possible explanation of this observation.

Did the patients who died differ at the time of the original examination in any respect from those who lived? This group was compared with the living patients in regard to sex and age at first visit. The

31. (*a*) Master, A. M.; Marks, H. H., and Dack, S.: Hypertension in People Over Forty, J. A. M. A. **121**: 1251 (April 17) 1943. (*b*) Friedman, B.; Moschkowitz, L., and Marrus, J.: Unilateral Renal Disease and Renal Vascular Changes in Relation to Hypertension in Man, J. Urol. **48**: 5, 1942. (*c*) Robinson, S. C., and Brucer, M.: Range of Normal Blood Pressure: A Statistical and Clinical Study of 11,383 Persons, Arch. Int. Med. **64**: 409 (Sept.) 1939. (*d*) Hines, E. A., Jr.: Range of Normal Blood Pressures and Subsequent Development of Hypertension: A Follow-Up Study of 1,522 Patients, J. A. M. A. **115**: 271 (July 27) 1940.

32. Manual of the International List of Causes of Deaths Based on the Fifth Decennial Revision by the International Commission, Paris, October 3-7, 1938, U. S. Department of Commerce, Bureau of the Census, 1940.

33. Linder and Grove,[3] Footnote 5.

34. Denker, P. G.: The Prognosis of Insured Neurotics, New York State J. Med. **39**: 238, 1939.

relative frequency of each sex was not statistically different, but the patients who died had been significantly older when first examined (table 3).

The causes of the 18 deaths are listed in table 12. The numbers are too few for statistical analysis, but the leading causes of death in this group were cancer, accidents and heart disease, causes similar to those in the general population and in the Hagerstown study.[35] There is no evidence that the causes of death in patients with neurocirculatory asthenia differ from those in the general population.

COMMENT AND SUMMARY

This study tells what happened to 173 patients with neurocirculatory asthenia (anxiety neurosis, effort syndrome) about whom information was obtained twenty years after their original examination and diagnosis. It shows that these patients, from a medical point of view, fared reasonably well, that they were not subject to an excessive amount of other disease and that from a personal and social point of view they seemed to be reasonably well adjusted citizens. The question then arises as to whether these patients are representative of the disorder as a whole. It should be borne in mind that these were private patients, that they had sought the advice of a cardiologist and that their income level was probably somewhat greater than that of the general population. The importance of these factors is not known. Also, it is possible that worry about heart disease played an important part as an emotion-provoking situation in the patient and that consulting a cardiologist might have led to more effective relief than in the case of a patient who did not have this particular worry.

Did these patients have the same condition that psychiatrists label anxiety neurosis, anxiety state or neurasthenia? The literature, in which various terms have been used for this disorder,[36] has led workers in this laboratory to conclude that the various terms refer to the same disorder; where data are given in past studies, the patients seem similar to the patients of this study. With respect to points in which data are not presented, it is impossible to determine whether they are similar. In addition, it is the impression of one of us (M. E. C.), a psychiatrist, that he is unable to distinguish between patients with neurocirculatory asthenia as diagnosed by cardiologists and anxiety neurosis and neurasthenia as diagnosed by psychiatrists.

The results of psychotherapy, from various reports, are presented (table 8), and the differences in these studies which made exact comparisons impossible are commented on. It has been suggested[37] that patients with psychoneurosis seen by psychiatrists and psychoanalysts have a more severe neurosis than those seen by internists. No evidence has been reported to support this view. There is no recorded evidence that the patients in this study are better off or worse off than are the patients who have received prolonged psychotherapy. The impression that at least they are no worse off is consistent with the results of the three year follow-up study from the Tavistock Clinic[38] and also with those reported by Ross,[38] which demonstrated that "short" psychotherapeutic treatment was associated with as good results as prolonged psychotherapy. This study suggests that even less psychotherapy, that is, the psychotherapy of simple reassurance and the passage of time, may yield as good results as the "short" psychotherapy reported by Ross. Moreover, the possibility must be entertained that all the studies, including this one, are concerned with the natural course of the disorder instead of the results of therapy, a point which was also suggested by Denker.[39]

There is in this era much unsupported speculation that diseases result from "anxiety" in human beings. Some authors suggest that diseases such as peptic ulcer,[40] diabetes mellitus,[41] rheumatoid arthritis,[42]

TABLE 12.—*Causes of Death and Code Numbers*

Patient	Age at First Visit	Age at Death	Sex	Cause of Death on Death Certificate	Code Number
1	30	36	M	Heat exhaustion	191
2	32	34	M	Chronic myocarditis Chronic Bright's disease Uremia	151b-93d
3	42	56	M	Carcinoma of kidney Lung metastasis Intestinal obstruction	82a-47d
4	42	60	M	Adenocarcinoma of sigmoid and rectosigmoid	46e
5	20	29	M	Asphyxiation by illuminating gas	176a
6	40	73	M	Bronchopneumonia Arteriosclerotic heart disease	93d-170a
7	34	47	M	Acute bronchopneumonia (left lower lobe) Fibrosarcoma of lungs with adrenal thyroid, occipital bone metastatic from neurocarcinoma, right thigh	85e-47e
8	43	57	M	Hypostatic congestion of lungs Chronic myocarditis	93d
9	28	29	M	Coronary thrombosis	94-a-0
10	28	44	F	Grave hysteria Emotional disturbance and extreme heat of day	191
11	38	57	F	Acute cardiac failure Pulmonary edema, hypertensive heart disease, hypertension, obesity, diabetes mellitus	61-85d
12	42	61	F	Adenocarcinoma of breast	50
13	51	66	F	Cerebral hemorrhage (result of fall, striking head)	185a-82a
14	20	32	F	Accidental burns (first and second degree)	18d
15	28	30	F	Multiple fractures and injuries (said to have jumped from roof while temporarily insane—suicide)	166e
16	29	53	F	Intracranial left ventricular hemorrhage, traumatic, accidental	170a
17	36	38	F	Myocarditis terminal, probable carcinoma of liver	46b-98b
18	55	55	F	Addison's disease, chronic interstitial nephritis, gallstones	65-131a

35. Cioceo, A.: Chronic Sickness in Relation to Survivorship Twenty Years Later, Human Biol. **21**: 33, 1946.

36. (a) Beard, G. M.: Neurasthenia or Nervous Exhaustion, Boston M. & Surg. J. **3**: 217, 1869. Savill, T. D.: Clinical Lectures on Neurasthenia, New York, William Wood & Company, 1899. (b) Freud, S.: Ueber die Berechtigung, von der Neurasthenie Einen Bestimmten Symptomen Complex als "Angstneurose" Abzutrennen, Neurol. Centralbl. **14**: 50, 1895. (c) Lewis, T.: Medical Research Committee: Report Upon Soldiers Returned as Cases of "Disordered Action of the Heart" (D. A. H.) or "Valvular Disease of the Heart" (V. D. H.), London, His Majesty's Stationery Office, 1917. Oppenheimer, B. S.; Levine, S. A.; Morison, R. A.; Rothschild, M. A.; St. Lawrence, W., and Wilson, T. N.: Report on Neurocirculatory Asthenia and Its Management, Mil. Surgeon **49**: 409, 1918.

37. Brill, A. A.: Discussion on Symposium on Therapy of the Psychoneuroses, Arch. Neurol. & Psychiat. **57**: 506 (April) 1947. Kubie, L.; Discussion on Symposium on Therapy of the Psychoneuroses, Arch. Neurol. & Psychiat. **57**: 509 (April) 1947.

38. Ross, T. A.: An Enquiry into Prognosis in the Neuroses, Cambridge, Mass., The University Press, 1936.

39. Denker, P. G.: Results of Treatment of Psychoneuroses by the General Practitioner, New York State J. Med. **46**: 2164, 1946. Denker, P. G.: Results of Treatment of Psychoneuroses by the General Practitioner: A Follow-up Study of Five Hundred Patients, Arch. Neurol. & Psychiat. **57**: 504 (April) 1947.

40. (a) Boring, E. G.; Langfeld, H. S., and Weld, H. P.: Foundations of Psychology, New York, John Wiley & Sons, Inc., 1948, p. 532. (b) Wolf, S., and Wolff, H. G.: Evidence on the Genesis of Peptic Ulcer in Man, J. A. M. A. **120**: 670 (Oct. 11) 1942.

41. Dunbar, F.: Psychosomatic Diagnosis, New York, Paul B. Hoeber, Inc., 1943, p. 498.

42. Dunbar, F.: Synopsis of Psychosomatic Diagnosis and Treatment, St. Louis, C. V. Mosby Company, 1948, chap. 8, p. 295.

asthma,[43] ulcerative colitis [44] and hypertension [45] are the results of an ill defined entity called "anxiety." With respect to this theory, it should be noted that this group of patients who suffered off and on for twenty years with symptoms including apprehensiveness, nervousness, palpitation and trembling, symptoms which are classically considered by some psychiatrists to represent "anxiety" or manifestations of "anxiety," [46] did not experience to any conspicuous extent any of the illnesses which are supposed to develop in persons with "anxiety."

Fewer patients have died than might have been expected to do so from calculations based on the mortality rates for the general population. This might be explained by the fact that these patients were probably above average in income, education and social level or by the fact that possibly they paid more attention to their health than the average person, or it may be related to the fact that they were known to be well except for neurocirculatory asthenia twenty years previously. Persons who take out insurance are probably more like these patients in these respects, and they are also known to have a lower mortality than the general population.* The mortality rates for insured persons are based on amount of insurance in force and amount of claims, rather than on persons and deaths. The validity of this method for estimating expected death is not entirely established.

It remains rather striking to find that these patients had a lower mortality during the past twenty years than groups of persons of comparable age. The exact explanation of this is not clear. It may be an artefact of the comparisons or may be related to the neurocirculatory asthenia itself.

Although one cannot be certain that these patients with neurocirculatory asthenia had a lower mortality than persons without neurocirculatory asthenia, it may be stated with confidence that neurocirculatory asthenia does not lead to early death.

These favorable follow-up data, with respect to both health and mortality, can probably be used as future sources of reassurance to the patient who is worried and frightened by the symptoms of this disorder.

This study demonstrates that neurocirculatory asthenia does not of necessity have a bad prognosis, nor is the patient of necessity incapacitated. This suggests that in both military and veterans groups, the assumptions and beliefs about the condition should be reexamined. Does having the disorder automatically lead to military disability? May the assumption on the part of selective service and miltary physicans that the disorder is always disabling enhance the disability? It is of interest that the amount of disability reported by veterans is greater than that of nonveterans. The problem of the effect of pension and compensation awarded only as long as the patient remains disabled should be scientifically studied to learn accurately whether any relationships exist.

43. Fenichel, O.: Outline of Clinical Psychoanalysis, New York, W. W. Norton & Company, Inc., 1934, p. 223. French, T. M.: Psychogenic Factors in Asthma, Am. J. Psychiat. 89:87, 1939.

44. Green, J.: Psychogenesis and Psychotherapy of Ulcerative Colitis, Psychosom. Med. 9:151, 1947.

45. Saul, L. J.: Hostility in Cases of Essential Hypertension, Psychosom. Med. 1:153, 1939.

46. Hecker, E.: Ueber Larvirte und Abortive Angstzustände bei Neurasthenie, Centralbl. f. Nervenh. 4:565, 1893. Freud,[MD] Boring, Langfeld and Weld.[MD]

Follow-up studies are then not too difficult to make. Patients can be found if the examiners wish to find them, and adequate follow-up study might resolve many problems related to chronic disease.

CONCLUSIONS

1. After a twenty year follow-up study of 173 patients with neurocirculatory asthenia (anxiety neurosis, effort syndrome, neurasthenia), it was concluded that this is usually a chronic disorder which does not interfere significantly with the patients' work or social or family life, nor does it cause death. This conclusion is based on the fact that in this study 12 per cent of the patients recovered, 35 per cent had symptoms but no disability, 38 per cent had symptoms with mild disability and 15 per cent had symptoms and moderate or severe disability.

2. There is no evidence to suggest that patients with this disorder develop, in high prevalence, hypertension, heart disease, peptic ulcer, diabetes mellitus, asthma, thyrotoxicosis ,ulcerative colitis, hysteria or schizophrenia. Although these patients all have what is called "anxiety," as a group they did not develop to a high frequency diseases which have recently been said to be caused by anxiety. It is concluded that there is no evidence that anxiety causes these diseases.

3. Fewer deaths occurred in this group than were statistically expected, but it is not known whether this is an artefact due to the nature of the groups used for comparison or whether it is truly a feature of the disorder. Neurocirculatory asthenia certainly does not lead to a high mortality rate.

4. The published results of therapy in apparently similar cases managed by prolonged psychotherapy, psychoanalysis and other methods, such as electric convulsive procedure, ergotamine tartrate and adrenal denervation, present no consistent or conclusive evidence that patients treated by these means get along better than patients who have had little more therapy than simple reassurance and the passage of time.

5. It is concluded, with reference to the technic of follow-up studies, that it is possible to locate and secure the cooperation of the majority of patients for a follow-up study, even twenty years after their original examination and diagnosis.

ABSTRACT OF DISCUSSION

Dr. Arthur M. Master, New York: Dr. Wheeler has used terms that are most appropriate, neurocirculatory asthenia, effort syndrome and anxiety neurosis. Some physicians have always believed that what these patients require is reassurance; the present report proves this statistically. The belief that drugs are of no avail has also been confirmed. It would seem from the data that the patients do well in an environment in which they do not experience stress and strain. These patients find that they are unable to drink, smoke or eat large amounts. They must live sheltered lives. Perhaps that explains the decreased incidence of hypertension and organic heart disease in later life. The observation that they live as long as the average person confirms the impression that even when organic heart disease develops in these patients they do better than the average person. Perhaps this is because they possess small hearts to begin with. I have seen occasional patients with severe hypertension in whom the heart did not appear enlarged; however, when the opportunity to see their old roentgenograms presented itself, the heart was found to have been smaller. These patients constitutionally are inferior. They are asthenic and usually have a long, narrow chest, and it is my opinion that

the volume of the heart is small. The vasomotor responses are therefore inadequate. The blood pressure and pulse response to standard exertion lags. The two-step exercise electrocardiogram may be abnormal. Thus, on exertion they have a functional coronary insufficiency which is probably neurogenic. These abnormal vasomotor responses agree with what Dr. Wheeler and his associates have reported elsewhere, namely, that these persons have high lactic acid concentration and low oxygen consumption when they try to do hard work. These men are inadequate in war, especially in combat zones, and can be used only on limited duty. They require frequent hospitalization and may have to be supported for the rest of their lives. The authors have made a genuine advance in a field in which theory and fancy had replaced fact.

DR. HOBART A. REIMANN, Philadelphia: It is true that cardiologists have made many observations on the condition called neurocirculatory asthenia; but the disorder is of other origin, and symptoms or signs referable to the heart and circulation represent only a small portion of the general clinical picture. It is often a mistake to refer these patients to cardiologists, since the attention of the patient is wrongly focused on the heart, giving rise to heart consciousness and unnecessary worry. This has been called iatrogenic medicine, that is, disease caused by the physician. The various names applied to the disorder indicate how poorly understood it is. Many of the patients with neurocirculatory asthenia belong to the group of persons regarded as vagotonic by Eppinger and others. The function of a cardiologist should be limited to ruling out organic cardiac disease in doubtful cases. I should like to know whether Drs. Wheeler and Master in their follow-up studies have encountered patients in whom attention unduly directed to the heart has led to the fear of heart disease in this condition.

DR. E. O. WHEELER, Boston: In answer to Dr. Reimann's question, I believe that many of these patients, when they originally came to a cardiologist, had a fear of heart disease which played an important part in aggravating their symptoms and that reassurance at that time, to the effect that they had no heart disease, was an important factor in making them feel better. It is true that some patients were never convinced that they did not have heart disease and during the entire period of twenty years believed that something was wrong with their heart. Dr. Walker's question brings up the difficulties inherent in the evaluation of the health of these patients and the problems in comparing the course of the disorder in our patients with its course in other patients reported in the literature. He implies that patients treated by psychotherapy and listed as improved or slightly improved were free of symptoms, which was not so. We have attempted to make these evaluations from recorded data and to systematize our evaluation as much as possible, so that it would be possible for others to duplicate the procedure. In comparing these patients with those reported in the literature, certain problems arise: do they have the same disorder, were they selected in a comparable manner, were all the patients followed, was the period of follow-up comparable and were the results of treatment or course of the disorder evaluated in the same way? We believe that the comparison we have made is as accurate as the data allow. Until more data are obtained on patients treated by various means and these data are published in detail, such comparisons will be difficult to make.

Contract Practice.—Contract practice as applied to medicine means the practice of medicine under an agreement between a physician or a group of physicians, as principals or agents, and a corporation, organization, political subdivision or individual, whereby partial or full medical services are provided for a group or class of individuals on the basis of a fee schedule, or for a salary or for a fixed rate per capita. Contract practice *per se* is not unethical. Contract practice is unethical if it permits of features or conditions that are declared unethical in these Principles of Medical Ethics or if the contract or any of its provisions causes deterioration of the quality of the medical services rendered.—Section 3, Chapter III of the PRINCIPLES OF MEDICAL ETHICS of the American Medical Association.

SURGICAL INTERVENTION ON THE CILIARY BODY

New Trends for the Relief of Glaucoma

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The idea of acting on the ciliary body to reduce the aqueous output and consequently to lower the intraocular tension is not a recent therapeutic advance. From the cyclotomy of Hancock [1] and Abadie,[2] the sclerocyclotomy with thermocautery of Fiore [3] and the cyclectomy of Verhoeff [4] developed. Other clinical or experimental attempts to reduce eye tension by means of cauterizations of the pericorneal or ciliary region were performed by Hamburger [5] (silver nitrate cauterizations), by L. Weekers,[6] by Puscariu and Cerkez,[7] by Favaloro [8] (following the technic of Schoeler [9]), by Preziosi [10] and by Curran.[11] The two latter aimed also at a good filtration by perforating the sclera with galvanocautery.

All these procedures had, however, only a restricted number of followers because of the fear that excessive damage to the ciliary body might arise.

A new epoch in this field was opened by the use of diathermy, and in 1932 Weve [12] and Amsler [13] performed superficial coagulations of the ciliary body, sometimes in association with perforating punctures.

But it was Vogt [14] who in 1937 suggested an operation which has since been largely employed in Europe and in America. His method consists of multiple diathermic perforations of the sclera in the ciliary region with an extremely thin and short needle (0.2 mm. thick and 3 mm. long). Extensive statistics are reported, especially by Meyer [15] (142 cases) in America and by Thiel,[16] who in 1943 collected 336 cases from several German clinics. Other contributions come also from Italian (Biozzi,[17] Longhena [18] and Cristini [19]) and other European ophthalmologists (Thomas, Cordier, Algan and Poirot [20] and Müller and Kohlhaas [21]). Redslob [22] performs only a few perforating coagulations without dissecting the conjunctiva, and he advocates his procedure for buphthalmos.

Cyclodiathermic puncture is recommended in cases in which other surgical methods have failed or cannot be attempted, and it is still to be considered, according also to Thiel,[16] as an ultima ratio for the relief of glaucoma. According to the statistics of Thiel about 55 per cent of cases involving conditions other-

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2. Abadie, C.: Arch. d'opht. **26**:262, 1910.
3. Fiore, T.: Ann. di ottal. **57**:820, 1929.
4. Verhoeff, F. H.: Arch. Ophth. **58**:228, 1934.
5. Hamburger, C., in discussion on Preziosi.[10]
6. Weekers, L.: Arch. d'opht. **48**:186, 1931.
7. Puscariu, E., and Cerkez, V.: Ann. d'ocul. **163**:484, 1926.
8. Favaloro, G.: Lettura oftal. **4**:75, 1927.
9. Schoeler, cited by Favaloro.[8]
10. Preziosi, L., in the proceedings of the Thirteenth International Ophthalmological Congress, Amsterdam, 1929.
11. Curran, E. J.: Arch. Ophth. **54**:321, 1925.
12. Weve, H.: Zentralbl. f. d. ges. Ophth. **29**:562, 1933.
13. Amsler, M.: Arch. d'opht. **1**:856, 1937.
14. Vogt, A.: Klin. Monatsbl. f. Augenh. **99**:9, 1937; **103**:391, 1939; **106**:232, 1941.
15. Meyer, S. J.: Am. J. Ophth. **31**:1504, 1948.
16. Thiel, R.: Klin. Monatsbl. f. Augenh. **109**:744, 1943.
17. Biozzi, G.: Riv. di ottal. **1**:679, 1940.
18. Longhena, L.: Boll. d. ocul. **26**:7, 1947.
19. Cristini, G.: Gior. ital. oftal. **1**:1, 1948.
20. Thomas; Cordier; Algan, and Poirot: Bull. Soc. d'opht. Paris, April 1948, p. 205.
21. Müller, H. K., and Kohlhaas, W.: Klin. Monatsbl. f. Augenh. **113**:385, 1948.
22. Redslob, E.: Ann. ottal. e clin. ocul. **72**:451, 1946.

wise not operable appear to be controlled, generally without the use of myotic agents, yet in some instances scleral necrosis, hemorrhage, phthisis bulbi and cyclitis occurred. Similar complications are reported also by other authors, and in some cases (including some of mine) enucleation was later necessary. In Streiff's [23] case, pathologic examination revealed sympathetic ophthalmia. Also, in a case of Thomas [20] and associates sympathetic ophthalmia developed. Because of the aforementioned complications, some persons are still reluctant to use Vogt's operation freely, and in these last years other, apparently more harmless, methods have been proposed.

I will first review superficial nonperforating cyclodiathermy, which, already employed by Weve [12] in 1932 and by Larsson [24] in 1934, was particularly advocated in 1942 by Albaugh and Dunphy [25] in America and by L. Weekers and R. Weekers [26] in Europe. The two procedures are somewhat different in their technics and aims.

Albaugh and Dunphy look for a lowering of the intraocular tension through destruction of more or less large tracts of the ciliary body with the use of a flat diathermic electrode applied on the bared sclera over one half of the globe 4 to 5 mm. from the limbus. Here a row of coagulation points adjacent to one another is made. Eighteen patients with glaucoma were operated on with this method (2 of them with associated perforating cyclodiathermy), and in only 4 cases did the operation fail. Sections of eyes enucleated after the operation showed destruction of the ciliary body in the treated areas, a result which is interpreted as the direct consequence of the heat effect and not as trophic in origin because of destruction of the innervation. Cyclodiathermy is considered the operation of choice, not only for hemorrhagic glaucoma but also when other means of therapy have failed and when an opening of the eye is to be avoided.

At approximately the same time, in 1942, L. Weekers and R. Weekers, [26] in their experimental researches, showed the possibility of lowering the tension of the rabbit's eye by means of superficial scleral coagulations on the ciliary body, a result previously obtained by L. Weekers [6] with superficial galvanocauterization of the sclera at some millimeters from the limbus. The lowering of the intraocular tension, which lasts for about two weeks, is preceded by a hypertensive phase of some hours just after the intervention. Similar changes, although less pronounced, occur also in the other, untouched, eye. Histologic examinations showed that the main feature after diathermy consisted of an enormous vasodilatation not only of the ciliary body but also of the neighboring iris and choroid. These experiences were soon followed by the clinical use of diathermy applied superficially on the ciliary body without perforation. A small, flat electrode, 0.75 mm. thick and 1 mm. high, was used. The electrode was placed 7 mm. from the limbus on the conjunctiva, and eight coagulations were performed in every case, two in each quadrant, between the tendons of the four recti. Later, more coagulations, twelve to twenty, always encircling the limbus at 7 to 8 mm. from it, were made. With the help of a pyrometric electrode the temperature was measured during the coagulation; the most effective temperature is said to lie between 90 and 95 C. at the fifth second, this temperature being kept constant for ten more seconds. In 1945 and 1946 results concerning operations on 76 patients, some of them followed for several years, were reported. Nonperforating cyclodiathermy was used in simple and inflammatory chronic glaucoma, in acute glaucoma, in various types of secondary glaucoma, in painful absolute glaucoma and in infantile glaucoma. Later, in 1948, the results were reported in 24 cases of iridocyclitis with hypertension, with readings varying from 30 to 75 mm. of mercury.[27]

The use of nonperforating cyclodiathermy is suggested first in chronic glaucoma when previous operations have failed. It may also be used in several forms of secondary glaucoma, particularly in uveitis with hypertension, and in absolute painful glaucoma. The method is less effective in acute glaucoma and buphthalmos. The behavior of the intraocular pressure after cyclodiathermy is substantially like that observed in the experimental researches in rabbits. After a more or less pronounced rise immediately after the operation, the tension falls regularly to under 20 mm. of mercury after one to two days and then rises again gradually for two to three months, reaching, however, figures which are in the majority of the cases inferior to the original ones and are often normal. The greatest difficulty of the procedure lies in the necessity of obtaining permanent results without excessive damage to the eye. For that reason the best results are undoubtedly those observed in uveitis, in which a temporary action is generally required until the moment the uveitis is over.

In regard to the mode of action of superficial diathermy in lowering the ocular tension, the result is attributed to a prolonged widening of the uveal vessels, especially those of the ciliary region. A change in the ocular fluid-exchange results. A certain degree of ciliary body atrophy may be present, but, according to the Weekers,[26] it is far less important than the vascular changes. These changes are explained by the impairment of the nerve supply of the vessels by the coagulations. The regeneration of the nerves is accompanied by a gradual rise in the intraocular pressure. The lesions of the orthosympathetic and parasympathetic nerves produced by the diathermy were recently demonstrated, according to the Weekers, by the altered susceptibility to the pupillokinetic drugs, methacholine chloride, epinephrine (increased) and cocaine (reduced).

Superficial cyclodiathermy has, through the works of Albaugh and Dunphy and the two Weekers, gained some favor, and several authors, both in Europe and in America, have reported good results in particular instances.[28]

To reduce the heating effects of diathermy on the surrounding tissues and fluids and to concentrate better the action on the ciliary body, Thiel [29] proposed subscleral coagulation by means of a cyclodialysis spatula 12 mm. long. This is introduced between the sclera and the ciliary body, at 5 to 7 mm. from the limbus and parallel to the limbus for at least 10 mm. Then the cur-

23. Streiff, E. B.: Klin. Monatsbl. f. Augenh. **101**:910, 1938.
24. Larsson, S.: Deutsche Ophthalmologische Gesellschaft, Heidelberg, 1934.
25. Albaugh, C. H., and Dunphy, E. B.: Cyclodiathermy: Operation for Treatment of Glaucoma, Arch. Ophth. **27**:543 (March) 1942.
26. Weekers, L., and Weekers, R.: Ophthalmologica **108**:212, 1945; Nonperforating Thermometric Cyclodiathermy in Treatment of Hypertensive Uveitis, Arch. Ophth. **40**:309 (Nov.) 1948.
27. Francescheti, A., in discussion on Weekers, R.: Bull. et mém. Soc. franç d'opht. **60**:251, 1947.
28. Kalt, M., in the Proceedings of the Congrès de la Société française d'ophthalmologie, Paris, Masson & Cie, 1949. Francescheti.[27]
29. (a) Thiel, in discussion on Schreck.[30] (b) Thiel.[31]

rent is allowed to pass, and a two to three second coagulation with an intensity of 20 milliamperes is performed. The coagulation may be repeated in the opposite direction if necessary.

This procedure was used also by Díaz-Domínguez.[30] The spatula is directed toward the anterior chamber until its end appears. The current is then turned on, and the spatula is moved up and down, coagulating one third to one fourth of the ciliary body. Before the spatula is removed the current is disconnected. This procedure, which provides, in addition to the coagulation of the ciliary body, for drainage from the anterior chamber to the suprachoroidal space (as does cyclodialysis), is said to give results not inferior to those obtained with Vogt's perforating technic.

Because of the war I was not well informed about the results of nonperforating cyclodiathermy, and I too was looking for a means, not so radical as perforating diathermy, of acting on the ciliary body. This means was found in the use of solid carbon dioxide, which, because of its property of producing an adhesive choroidoretinitis when applied on the sclera, had already been suggested and used by me for the therapy of retinal detachment [31] and had been employed with good results also by Deutschmann [32] and by Gilbert and

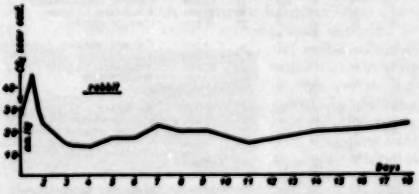

Fig. 1.—The course of the intraocular tension in the eye of a rabbit after solid carbon dioxide cauterizations of the ciliary body.

Krause.[33] Later, I used this procedure only in a restricted number of cases, primarily because its effect was milder than that obtained by diathermy. This milder action encouraged me to use it for ciliary body applications in glaucoma.[34]

The mode of action of solid carbon dioxide on the tissues is quite different from that exerted by diathermy. There is no coagulation, and the effects of freezing are generally reversible and specially related to a vascular action. Nervous elements and epithelial cells are particularly sensitive to cold (—80 C.). I measured with a thermoelectric couple the temperature of the tissues of the eye during the application of solid carbon dioxide and saw that the frozen area was sharply circumscribed; in effect, 2 mm. outside this area the reduction of temperature does not exceed 15 C. When the application was done at the ora serrata, the temperature at the equator of the lens was diminished by 13.5 C.

When a solid carbon dioxide cylinder of 4 mm. diameter is applied for thirty to sixty seconds in five to six adjacent areas on the sclera of the ciliary region of the rabbit, after or without dissection of the overlying conjunctiva, an inflammatory reaction appears in the anterior segment of the eye and, after an initial rise of the intraocular tension (5 to 15 mm. of mercury), is followed by hypotony. This reaches its maximum (8 to 10 mm. of mercury) between the third and the tenth day after the application of solid carbon dioxide while the reactive phenomena disappear. The ocular pressure rises again later, attaining on the

Fig. 2.—Edema of the ciliary processes in the eye of a rabbit after solid carbon dioxide cauterization of the ciliary body.

fifteenth to the twentieth day figures slightly lower or equal to the original ones (fig. 1).

At histologic examination a few hours after the application there appear edema of the tissues (fig. 2) and an enormous vascular dilatation of the anterior eye segment, especially of the ciliary body, while the vascular bed is filled with compact and dense masses of blood. The ciliary epithelium shows the so-called Greeff's blisters, which detach it. Red blood cells may be seen within a rich albuminoid exudate in the anterior chamber.

Fig. 3.—Slight atrophy of the ciliary body and thickening of the ciliary epithelium in the eye of a rabbit three months after solid carbon dioxide cauterization of the ciliary body.

In the next days the exudative, hemorrhagic and edematous phenomena decrease, and some weeks after the operation only modest changes can be detected. These are represented by moderate atrophy of the ciliary body, especially in its flat portion, by irregularities in the distribution of pigment and by alteration of the ciliary epithelium, which is slightly irregular and sometimes thicker (fig. 3).

30. Díaz-Domínguez, D.: Arch. Soc. oftal. hispano- am. 8:117, 1948.
31. Bietti, G. B.: Boll. d'ocul. 13:576, 1934.
32. Deutschmann, R.: Klin. Monatsbl. f. Augenh. 94:349, 1935.
33. Gilbert and Krause, cited by Deutschmann.[32]
34. Bietti, G. B.: Atti Cong. Soc. ital. oftal. 1947, to be published.

The anatomic changes easily explain the behavior of the intraocular pressure after freezing of the ciliary region. The augmented blood supply of the uveal vessels and the increased colloido-osmotic pressure of the aqueous humor because of its higher albumin content correspond to the hypertonic phase of the first day. The phenomena of stasis in uveal capillaries, however, produces later a reduction of their hydrostatic pressure,

Fig. 4.—Solid carbon dioxide container. (Drapier-cryocautery).

while the colloido-osmotic pressure of the blood is increased; from this results the hypotony, which is also encouraged by the lesions of the ciliary epithelium and the inflammation of the ciliary body and which is sustained by the capillary-toxic products resulting from the disintegration of the exudates. Later, when the aforementioned conditions disappear, hypotony can last only because of the trophic lesions of the ciliary body (which are, with this procedure, quite modest) and of the ciliary epithelium and ciliary nerve supply.

After this experimental research I employed solid carbon dioxide in cases of human glaucoma. Freezing of the ciliary body was obtained with solid carbon dioxide cylinders or with the so-called cryocautery, which employs the former together with acetone (fig. 4). The applications (about two minutes long) are performed on the ciliary region over the conjunctiva, without dissection of it. Generally there

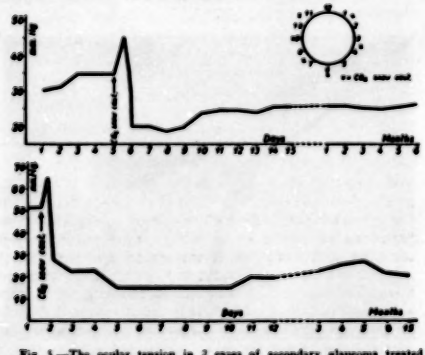

Fig. 5.—The ocular tension in 2 cases of secondary glaucoma treated with solid carbon dioxide cauterization.

were no more than eight applications. These were distributed over one half the circumference of the globe adjacent to one another in a single row or along the horizontal and vertical and on the two oblique meridians between and at the insertion of the four recti. The applications are always 3 to 4 mm. from the limbus. Cocaine was previously instilled, and retrobulbar injection of procaine hydrochloride can also be added.

I have treated, until the time of writing, 21 patients (fig. 5), and the results obtained are reported in table 1. The periods of observation range from two and one-half years to three months.

The applications were generally well tolerated. Shortly after the application, a conjunctival-palpebral edema, which lasts for two to four days, develops, and in the first hypertensive phase the patients generally have considerable pain, which can be relieved by the use of ordinary analgesic agents and the instillation of myotic drugs. These should be later abandoned, and, according to the intensity of the iris reaction, mydriatic drugs may be used. In some cases slight hemorrhages in the anterior chamber and iritis developed. In 16 cases the final intraocular tension

TABLE 1.—*Tension and Glaucoma Type in 21 Patients Treated with Solid Carbon Dioxide Cauterization*

Case No.	Ocular Tension Before Solid Carbon Dioxide Application (Mm. Hg)	Minimal Tension Reached and Day		Final Tension and Time Elapsed Since Solid Carbon Dioxide Application		Glaucoma Type
		Mm. Hg	Day	Mm. Hg	Time	
1	70	10	120	11	15 mo.	Chronic inflammatory
2	65	20	5	28	30 mo.	Secondary to iritis
3	90	42	3	27	14 mo.	Chronic simplex
		20	9			
4	30	20	13	30	3 mo.; 17 days	Chronic simplex (operated)
5	52	15	5	20	29 mo.	Secondary to iritis
6	48	30	3	26	5 mo.; 20 days	Hemorrhagic
		26				
7	65	12	30	15	62 days	Secondary to detached retina
8	50	13	8	22	11 mo.	Chronic simplex
9	35	12	16	20	20 mo.	Chronic simplex trachoma
10	35	14	3	25	3 mo.	Secondary to detached retina
11	90	38	6	35	6 mo.; 15 days	Chronic inflammatory
		25	17			
		34	27			
12	65	6	12	29	50 days	Secondary to intumescent cataract
13	45	28	4	28	3 mo.	Secondary to burns
14	40	28	6	35	3 mo.	Secondary to cataract extraction
15	60	26	3	40	3 mo.	Secondary to cataract extraction
		27	16			
		30	32			
16	70	30	8	25	3 mo.	Acute
17	100	60	9	50	.....	Secondary to lens luxation
18	80	40	30	35	4 mo.	Hypertensive uveitis
19	40	17	4	25	4 mo.	Combined with aniridia
20	60	8	10	12	4 mo.	Hypertensive uveitis
21	48	30	10	22	4 mo.	Hypertensive uveitis

was definitely lower than the original tension, and in 12 of these cases the tension was completely controlled. Two of these patients had previously been unsuccessfully operated on with nonperforating cyclodiathermy. In 5 patients the pressure after some weeks again reached the original figures. In 2 patients a long-lasting hypotony (10 to 12 mm. of mercury) developed.

Because of the limited number of cases, I am still unable to tell which type of glaucoma responds best to the freezing treatment, but perhaps the best results were obtained in hypertensive uveitis. This assumption is in agreement with the results the Weekers [28] obtained with superficial cyclodiathermy. However, freezing has some advantages over superficial cyclodiathermy: there is less danger of permanent damage to the ciliary body; there is less scarring of the conjunctiva, and there are no secondary effects on the lens from repeated heating. The common disadvantages of my procedure with superficial cyclodiathermy are the hypertensive phase and an effectiveness undoubtedly inferior to perforating cyclodiathermy. The applications can, however, be repeated practically without limit.

An apparently different way to reduce the amount of aqueous humor secreted by the ciliary body was recently followed by Dupont Guerry III [35] and, seemingly independently, by several other European ophthalmologists. This technic involves the reduction of the blood supply by the coagulation of the long posterior ciliary arteries. A similar idea, which is derived from the experiments of Wagenmann [36] and of Bossalino,[37] who saw hypotony in rabbits when the long posterior ciliary arteries were interrupted, was advocated in 1924 by Favaloro.[38] He performed galvanic cauterizations over the equatorial region of the sclera in rabbits, and these cauterizations were followed by hypotony lasting about two weeks.

Guerry [35] also found that the coagulation of a single posterior ciliary artery with diathermy reduced the intraocular pressure in both the rabbit eye and the human eye for about two weeks. In human glaucoma (3 cases) the nasal artery was coagulated with bipolar diathermy current by means of perforations made along the visible course of the vessel with the Larkin electrode and with the Walker diathermy machine set at 45. Guerry points out that it is important to identify the artery, since, when punctures were blindly staggered in the equatorial region over the supposed course of the vessel, the tension was not affected. The coagulation of a single artery was relatively harmless, but when both long posterior ciliary arteries were occluded in the rabbit, phthisis bulbi with clouding of the cornea resulted in 50 per cent of the cases. The coagulation of a single artery is suggested as a procedure to prevent the initial rise of tension which occurs after nonperforating cyclodiathermy and as a substitute for posterior sclerotomy.

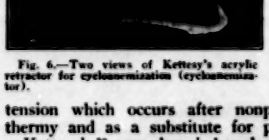

Fig. 6.—Two views of Kettesy's acrylic retractor for cycloanemization (cycloanemizator).

Kettesy's [39] procedure is based on the same principle as Guerry's angiodiathermy. Kettesy obstructs, with diathermy, both long posterior ciliary arteries just behind the insertions of the horizontal recti at the height of the pars plana of the ciliary body. He does this before the ciliary arteries enter the ciliary body, after the muscles are exposed on a squint hook and drawn to the side by a special acrylic retractor (fig. 6). The sclera is thus made accessible, and a 2 mm. broad and 6 to 7 mm. long strip of it, close to the muscle insertion, is coagulated with a spherical, 2 mm. wide, diathermic electrode.

Kettesy communicated his first results to the Hungarian Ophthalmologic meeting in September 1948, and I was able to attend in Debrecen, Hungary, when he performed the operation he calls cycloanemization. Figures about the success of the operation in specific cases are not yet available, but Kettesy told me that the results obtained by his procedure (performed until the time of writing in 63 cases) are at least equal to those obtained with cyclodialysis (the indications for which are the same as those for cycloanemization) without the dangers of the latter.

An advantage of the method is its harmlessness, and Kettesy advises it as the first procedure to be attempted when the vision is still normal. Moreover, the operation is a helpful complement when incomplete results are obtained with iridectomy or cyclodialysis. The best results were seen in cases in which the tension of the eye lay between 30 and 40 mm. of mercury, especially when the eye had been previously otherwise operated on.

The method is undoubtedly simple and safe, and I used it immediately after my visit to Kettesy.

I have operated on 16 eyes with glaucoma; the characteristics of these cases are reported in table 2. In nearly every case a decrease of the ocular tension, preceded by a sudden conspicuous rise just after the operation, was observed, but in 8 cases the tension increased again slowly, reaching levels higher than normal levels, although sometimes lower than the preoperative ones. The sudden rise in the tension after the operation made me doubt Kettesy's interpretation of his procedure's mode of action. I then noted that when the coagulations were performed under the two vertical recti almost the same results were obtained as with the Kettesy method. In a case of bilateral glaucoma with aniridia I observed even better results with this procedure than with Kettesy's original one. It must be admitted that the action of cycloanemization is at least partly similar to that exerted by superficial coagulations at 7 to 8 mm. from the limbus, according to the Weekers, even if an occlusion of the terminal branches of the long posterior ciliary arteries is obtained at the same time.

The most recent procedure for the relief of ocular hypertension through reduction of the blood supply of the ciliary body is that suggested by Schreck [39] in 1948 at the meeting of the German Ophthalmological Society

TABLE 2.—*Tension and Glaucoma Type in 16 Patients Treated with Cycloanemization*

Case No.	Ocular Tension Before Cycloanemization (Mm. Hg)	Minimal Tension Reached and Day: Mm. Hg	Minimal Tension Reached and Day: Days	Final Tension After Eight to Three Months (Mm. Hg)	Glaucoma Type
1	100	Unchanged		Unchanged	Secondary to lens luxation
2	47	35	7	48	Combined with aniridia
3	60	15	3	25	Combined with aniridia (coagulations under the vertical recti)
4	75	40	6	75 (no pain)	Hemorrhagic
5	40	18	12	18 (lens extraction, 22)	Secondary to lens luxation
6	40	10	6	28	Secondary to lens extraction
7	35	20	7	35	Chronic absolute (coagulations under the vertical recti)
8	40	15	7	27 (17 with pilocarpine)	Chronic (previous corneal trepanation)
9	60	14	12	45 (no pain)	Secondary to lens extraction
10	32	15	12	15	Secondary to operated epibulbar epithelioma
11	50	9	10	18 (after 25 days attack of acute glaucoma, 45; after iridectomy, 15)	Secondary to lens extraction
12	48	15	8	35 (no pain)	Secondary to lens extraction
13	38	20	2 to 10	23	Chronic
14	40	8	4	10	Congenital hydrophthalmos
15	70	12	7	60	Secondary to ulcerated cornea
16	60	15	6	35 (no pain)	Secondary to old uveitis

The method I used it immediately after my visit to Kettesy.

I have operated on 16 eyes with glaucoma; the characteristics of these cases are reported in table 2. In nearly every case a decrease of the ocular tension, preceded by a sudden conspicuous rise just after the operation, was observed, but in 8 cases the tension increased again slowly, reaching levels higher than nor-

35. Guerry, DuP., III: Am. J. Ophth. **27**:1132, 1944.
36. Wagenmann, A.: Arch. f. Ophth. **20**:1, 1890.
37. Bossalino, D.: Ann. di ottal. **39**:866, 1910.
38. Kettesy, A.: Brit. J. Ophth. **30**:643, 1946.

39. Schreck, E.: Zentralbl. f. d. ges. Oph. **50**:84, 1948.

in Heidelberg. He coagulates the long posterior arteries with anodic electrolysis by passing an electrode (fig. 7) similar to a cyclodialysis spatula (2 to 3 mm. broad, and 7 to 10 mm. long) under the sclera 8 to 11 mm. from the limbus in the suprachoroidal space and coagulating the arteries gradually with 0.8 to 1 milliamperes for ten seconds (or 2 to 3 milliamperes for four seconds). Schreck prefers anolysis to catolysis because the acid coagulation is more circumscribed and hemostatic than the alkaline one (colliquation necrosis). Diathermy has the disadvantage of heating the periuveal fluid and of being less controllable in its effects.

Schreck's procedure, although performed with a cyclodialysis spatula, differs from that of Thiel not only because of the use of electrolysis but also because Schreck's method is intended for long ciliary artery coagulation, while Thiel's aim is to coagulate the ciliary body.[29a]

With his method, the so-called cilioanolysis (fig. 8A), Schreck operated on 20 patients with glaucoma. The tension was controlled in 6 of 8 cases of chronic glaucoma (1 with the associated use of myotic drugs), in 4 cases of glaucoma simplex (1 with myotic drugs) and in 2 of 8 cases of absolute glaucoma (both with myotic drugs). In cases of painful noncontrolled absolute glaucoma, however, the pain generally disappeared.

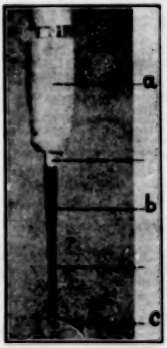

Fig. 7.—The electrode for anodic coagulation of the long ciliary arteries: (a) handle, (b) isolated part and (c) active cyclodialysis spatula-shaped part. (From Professor Schreck.)

Twenty-four additional patients with glaucoma were operated on by adding to the coagulation of the posterior ciliary artery the establishment of an electrolytic fistula from the anterior chamber to the suprachoroidal space and the posterior chamber by means of the so-called cycloanolysis. The technic, suggested especially for patients with tension over 40 to 50 mm. of mercury, consists of cyclodialysis with a spatula-shaped electrode introduced at 5 to 6 mm. from the limbus. A galvanic stream of 0.5 milliamperes is allowed to pass at the moment the point of the electrode reaches the scleral spur to enter the anterior chamber. The spatula is then moved gently toward the lower quadrant, parallel to the limbus, to coagulate the long posterior ciliary artery for fifteen to twenty seconds. In eyes with severe glaucoma the electrode is then moved toward the upper quadrant, coagulating the ciliary body surface for three to six seconds and in this way affecting some anterior ciliary arteries. If it is required, an internal fistula between the posterior chamber and the suprachoroidal spaces may be obtained by the following procedure: when the electrode (after the coagulations just described are performed) lies meridionally, with the point in the anterior chamber, the handle is lifted and the point slightly depressed against the junction of the iris root and the ciliary body, and the tissue is there coagulated for five to ten seconds. The current is then interrupted and the electrode retracted.

With ciliocycloanolysis (fig. 8 B) the ocular tension was controlled in 9 cases of glaucoma simplex and 2 of chronic glaucoma. Good results were obtained also in 6 of 7 cases of inflammatory glaucoma (4 with myotic drugs), in 2 of 4 cases of absolute glaucoma (1 with myotic drugs) and in 2 cases of secondary glaucoma.

The time between the performance of cilioanolysis or ciliocycloanolysis and the last examination was, for some patients sixteen months. In some few cases slight hemorrhages and perforation of the uvea with vitreous prolapse occurred.

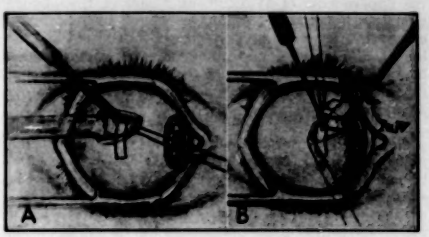

Fig. 8.—*A*, lateral cilioanolysis. *B*, lateral ciliocycloanolysis. The spatula-shaped electrode is first introduced under the sclera to reach the anterior chamber (position I), then turned in position II, III, and again I (IV). From the positions I to IV coagulation is performed. (From Professor Schreck.)

I operated on 10 eyes (6 with chronic primary glaucoma and 4 with secondary glaucoma) with ciliocycloanolysis. The tension was controlled in 8 cases, but the time since operation is too short to affirm that the results are permanent.

According to Schreck,[29] superficial diathermy and other similar procedures lower the intraocular tension because of the uveal hyperemia, which enhances the resorption of the aqueous humor by the venous system,

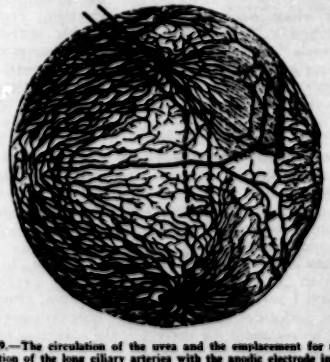

Fig. 9.—The circulation of the uvea and the emplacement for a proper coagulation of the long ciliary arteries with the anodic electrode introduced between sclera and uvea. (From Professor Schreck.)

a feature which influences the secretory activity of the arteries. Ciliocycloanolysis would represent the ideal method to dissociate the action exerted on the arteries from that exerted on the veins. The changes in the innervation of the ciliary body, as Baurmann [40] points out, also play a part, since, especially when cycloanolysis is performed, the ciliary nerve supply is largely

40. Baurmann, in discussion on Schreck.[29]

impaired. This is proved by the occurrence of corneal anesthesia, which is a consequence of every operation on the ciliary body (Albaugh and Dunphy [25] and the Weekers [26] in nonperforating cyclodiathermy, Thiel [16] in perforating cyclodiathermy, Bietti [24] in solid carbon dioxide cauterizations and Schreck [29] in ciliocycloanolysis).

The procedure employed by Schulte,[41] who coagulates the long posterior ciliary arteries, especially the nasal artery, which is larger and easier to reach since it enters at 13.4 mm. from the limbus instead of 19.2 mm. on the temporal side, is based also on the aforementioned principles and is somewhat similar to the methods just reported. Permanent results were, however, seen after eighteen months in only 1 patient of 4 who were operated on.

Albrich,[42] who failed to obtain permanent results by the coagulation of the long posterior ciliary arteries alone, obliterates also the anterior ones, according to the following technic.

With a corneal microscope or a binocular loupe, the anterior ciliary arteries are carefully identified (compression with a small glass rod elicits a pulsation in the arterial vessels, while the veins collapse under an even, minimal pressure), and a drawing of their position is prepared before the operation. The conjunctiva is then dissected, and every artery is diathermically closed. When the posterior long arteries, which are also coagulated, cannot easily be found, the overlying recti are resected and the scleral fibers dissociated until the vessel is properly exposed.

Statistics about the results of Albrich's operation are not yet published, but in a personal communication he wrote me that they are generally good. This is confirmed by Fleischer.[43]

Baurmann,[40] too, looked for a reduction of the intraocular tension by means of diathermocoagulation of the anterior ciliary arteries, which are identified with the help of the Seidel cup, but the results were not permanent.

CONCLUSIONS

Several conclusions can be drawn from this data regarding operations which attempt to restrain the aqueous output by reducing the blood supply and by modifying the circulatory conditions of the ciliary body.

Perforating Cyclodiathermy.—Perforating cyclodiathermy gives the most permanent results. Similar results can be obtained, as I have seen, by perforating anodic cyclopunctures, which are less radical than diathermy. The perforating methods result, however, in a higher percentage of complications, which include in some, although rare, cases phthisis bulbi.

Nonperforating Diathermy.—Less radical is nonperforating diathermy, according to Weve [12] and Albaugh and Dunphy,[25] particularly the diathermic applications over the conjunctiva of the ciliary region, according to L. Weekers and R. Weekers,[26] but the results seem generally less pronounced and the reduction of the eye tension less durable than with other operations. The same considerations can be made about the solid carbon dioxide cauterizations of the conjunctiva covering the ciliary region which I advocate.

Electrolytic or Diathermic Obliteration.—The results obtained with electrolytic or diathermic obliteration of the anterior or posterior long ciliary arteries are not so different from those with other methods. Although such procedures represent (with the exclusion of that suggested by Kettesy,[28] which acts, at least partially, as does nonperforating cyclodiathermy) a more refined technic and are better intended to affect the arterial vessels, avoiding damage to the veins, the obtained results seem not yet able to justify the use of these more complicated procedures.

Ciliocycloanolysis.—An exception is perhaps represented by the ciliocycloanolysis of Schreck,[29] which needs a more extensive trial before a definite judgment can be given regarding its effectiveness and possible complications.

All the aforementioned methods should be used only when previous operations have completely or partially failed or when the common surgical methods are expected to be unsuccessful (as with glaucoma in an aphakic eye or secondary to luxation of the lens, hemorrhagic glaucoma, flat anterior chamber or difficulty of filtration because of the conjunctival conditions). For the more severe forms perforating cyclodiathermy, anodic perforating cycloelectrolysis or ciliocycloanolysis should be used.

In cases in which a temporary result is considered sufficient (as in hypertensive uveitis, in hypertension following corneal grafts, in glaucoma due to the luxation of the lens, to be operated on for lens extraction in the hypotonic phase) the superficial diathermy of the Weekers (and the method of Kettesy) or the solid carbon dioxide cauterizations which I used may be advisable. My procedure seems particularly indicated for this purpose because of the modest reactive phenomena and the slight destructive effects.

The two last methods, moreover, because of their harmlessness if properly applied and because of the possibility of a practical unlimited repetition, may always be tried before more complicated and dangerous procedures, which can easily be done later, are performed. It is to be remembered that in many cases of painful absolute glaucoma, the two methods just mentioned, although they do not control the ocular tension completely and definitely, may reduce or abolish the painful symptoms.

SUMMARY

After a brief historical review of surgical intervention on the ciliary body for the relief of ocular hypertension, the more recent methods in this field are discussed.

Particular attention is paid to the methods acting superficially on the ciliary body: nonperforating diathermy on the bared sclera (Albaugh and Dunphy [25]) or over the conjunctiva (L. Weekers, and R. Weekers [26]); subscleral diathermic coagulation of the ciliary body (Thiel [16]), and solid carbon dioxide cauterizations (Bietti [24]) and to the technics the aim of which is the reduction of the blood supply to the ciliary body: diathermocoagulation of the long posterior ciliary arteries (Guerry [35]); cycloanemization with diathermy (Kettesy [28]); diathermocoagulation of the anterior ciliary arteries (Albrich and Baurmann), and cilioanolysis (electrolytic anodic subscleral coagulation of the long ciliary arteries) and cycloanolysis (electrolytic anodic cyclodialysis) according to Schreck.[29]

The results and the mode of action of the aforementioned methods, several of them personally and repeatedly tested by me, are reported and discussed.

The superficially acting methods are less dangerous than the perforating methods but are also less effective, since their action is sometimes only temporary. They are therefore particularly advisable when a transient

41. Schulte, in discussion on Schreck.[29]
42. Albrich, K.: Klin. Monatsbl. f. Augenh. **113**: 174, 1948.
43. Fleischer, in discussion on Schreck.[29]

lowering of the ocular tension is required, as in hypertensive uveitis or in hypertension following keratoplasty. Because of their harmlessness, however, and because of the possibility of an almost indefinite repetition, these superficially acting methods should be tried in every case of glaucoma in which the common methods have been, or are expected to be, ineffective. In case of failure to control definitively the ocular tension, a more severe operation (Vogt's perforating cyclodiathermy or electrolysis) can later be easily performed. In absolute painful glaucoma, even though the tension is not completely controlled at times, the operations mentioned before are generally able to eliminate the painful subjective symptoms.

ABSTRACT OF DISCUSSION

Dr. Conrad Berens, New York: To clarify some controversial points a questionnaire concerning perforating and nonperforating diathermy and cycloelectrolysis was sent to all members of the American Ophthalmological Society. Eighty members responded. Of these, thirty-two had performed none of these three procedures, one had performed all three types of operation, ten had performed both the diathermy procedures, twenty-one had performed only nonperforating diathermy, twelve had performed only perforating cyclodiathermy, one had performed only cycloelectrolysis (Yudkin, four eyes) and one had performed perforating cyclodiathermy and cycloelectrolysis. The total number of operations performed was: nonperforating diathermy, 201; perforating diathermy, 363, and cycloelectrolysis, 6. The physicians reported the following complications from these operations, which are somewhat at variance with Dr. Bietti's conclusions. Perforating diathermy was used on 363 eyes. No instances of sympathetic ophthalmitis were reported, but phthisis bulbi occurred in 14 cases (3.8 per cent). There were 4 severe hemorrhages, and the eyes in these cases were enucleated. There was 1 case each of retinal detachment, neuroparalytic keratitis and severe hypotony. One physician reported 10 operations with 10 failures, and another who had performed 12 operations reported unsatisfactory results in all 12 cases. Nonperforating diathermy was used on 201 eyes. Phthisis bulbi was observed in 13 eyes (6.5 per cent), a number significantly higher than that observed after perforating diathermy. Mild iritis was reported in 2 cases and iridocyclitis in 2 cases. Severe postoperative reaction with pain was noted in 1 case. Hypotony was reported in 4 cases, as compared to only 1 following perforating diathermy. From the comparison of the number of complications following perforating and nonperforating diathermy, it is evident that in America more complications follow the nonperforating procedure. This may be why surgeons in the United States seem to prefer Vogt's operation. Although Dr. Bietti reports 2 cases of sympathetic ophthalmitis, 1 by Streiff and the other by Thomas and his associates, no undoubted case occurred in this series of 564 operations or in the 193 operations on the ciliary body performed at the New York Eye and Ear Infirmary, a total of 757 operations. Included in this series are 47 cases reported by Dr. Alan Woods. In one of these cases, in which there was also an injury, sympathetic ophthalmitis occurred, but Woods does not believe that this complication should be attributed to diathermy. Although Verhoeff has not used diathermy, he doubted that it would cause sympathetic opthalmitis any more than would diathermy for retinal detachment. In a personal communication Dr. Paul Runge reported sympathetic opthalmitis occurring six weeks after nonperforating diathermy in a case of absolute glaucoma. I am most interested in Schreck's procedure of ciliocycloanolysis, in which one long posterior ciliary artery and the ciliary body are chemically treated with the positive pole of the galvanic current. He and his associates, during the past four years (1945 to 1949), performed cycloelectrolysis (negative pole) on 80 rabbit eyes and 65 human eyes, with results which were sufficiently encouraging for them to recommend the procedure to others for trial. Schreck, in his ciliocycloanolysis, selected the anode for the eye, with a current of 3 milliamperes for four seconds; this is similar to what my associates and I recommend in cycloelectrolysis through the conjunctiva, using the cathode. Our procedure is to apply 5 milliamperes of cathodal galvanic current for five seconds to the ciliary body. When the conjunctiva is elevated, a straight needle 1.5 mm. in length is used, and when the conjunctiva and sclera are both perforated, we recommend a 2 mm. needle. I have had no experience with Dr. Bietti's application of solid carbon dioxide to the ciliary region, but it appealed to me as an excellent procedure if a surgeon wished to obtain a more transitory effect with less traumatism than is ordinarily obtained with perforating diathermy or with cycloelectrolysis. However, the effect of these operations may also be graded by making fewer punctures. I hope that Dr. Bietti will discuss further the apparent discrepancy between his statement that complications are more prevalent following perforating diathermy than nonperforating diathermy, because this does not seem to agree with American experience and possibly may be accounted for by differences in the technic used on the Continent.

Dr. S. J. Meyer, Chicago: Dr. Bietti has given a thorough presentation of the methods that have been advocated for an attack on the ciliary body for the relief of glaucoma. The increase in intraocular tension characteristic of glaucoma may be brought about either by a blockage of the outflow of the intraocular fluid or by an abnormally increased production of this fluid. In the first instance, the drainage system is unable to evacuate the aqueous humor adequately, although this substance may be produced in normal quantities. In the latter instance, the aqueous humor produced in abnormally large amounts cannot escape through a normal drainage system which would be adequate in the presence of normal quantities of fluid. Therefore, the approach to the problem of influencing the balance of the intraocular pressure may be either in the direction of increasing the outflow or of decreasing the inflow of the intraocular fluid. Most surgical measures for the control of tension in glaucoma tend to increase the outflow. In surgical intervention on the ciliary body, the reverse is the case, as one attempts to decrease the inflow of the intraocular fluid. Procedures which might in part result in an inhibition of the aqueous-producing action of the ciliary body include: cyclodialysis (Heine); cyclectomy (Verhoeff); diathermic obliteration of the long posterior ciliary arteries (Guerry); nonperforating diathermy on the bared sclera (Albaugh and Dunphy) or over the conjunctiva (L. Weekers and R. Weekers); diathermocoagulation of the anterior ciliary arteries (Albrich and Baurmann); partial penetrating diathermic coagulation of the ciliary body (Vogt); catolysis, and solid carbon dioxide applications, as advocated by Dr. Bietti. I have had no clinical experience with the use of solid carbon dioxide, but I have operated on over 200 patients, using Vogt's technic of partial penetrating diathermic coagulation of the ciliary body. I have preferred this method because of its ease of application and its comparative freedom from postoperative complications. One must assume that, by destroying the blood vessels which are supplied by the long posterior ciliary arteries and which reach the corona ciliaris by passing through the pars plana, one impairs the circulation of the corona ciliaris to a point at which degeneration and atrophy result. This should result in a decreased production of intraocular fluid. What is the essential factor of ocular hypotony in Vogt's operation? Can it be attributed to the scleral microperforations or to the diathermy current? These two factors cannot be dissociated, since the needle is attached to the electrode and the passing of the diathermy current contributes to the perforation. The question is controversial. The operations reported by Weve in 1933 are, from this point of view, particularly interesting. Weve succeeded, in infantile glaucoma, in lowering the ocular tension by using surface diathermy application without perforating the sclera. Amsler obtained a similar result. Wagner, in attempting to solve the problem experimentally, did not succeed in lowering the ocular tension of rabbit eyes by surface application of diathermy current. Conversely, Albaugh and Dunphy and L. Weekers and R. Weekers were

successful in securing a definite lowering of the ocular tension by the use of diathermy current without scleral perforation. All the operations which are efficacious in chronic glaucoma produce a traumatism which in turn produces a persistent uveal vasodilatation and an increase in the resorption of the ocular fluid. As an accessory, there is often a certain degree of atrophy of the ciliary body and a decrease in the production of aqueous humor. This atrophy establishes itself eventually and only interferes slowly. Diathermy, and possibly solid carbon dioxide application over the ciliary body, is an excellent means of provoking, in a measured way, uveal dilatation, which, when it is held within certain limits, becomes useful in the treatment of glaucoma. Diathermy produces minimal or excessive effects and all the intermediary stages, which are expressed by the following changes: pigmentary deposits and their migration, discrete posterior synechias, disturbance of the aqueous humor, iritis, hyphema, persistent neovascularization and discoloration of the iris and partial atrophy or even complete atrophy of this tissue. For the practical ophthalmologist, the following facts are of importance: 1. Cyclodiathermic puncture is simple and safe and can be repeated several times in cases where there is malignant growth. 2. It is the only workable procedure in cases of a shallow anterior chamber. 3. Surgical procedures for cataract, in cases complicated by glaucoma, need no longer be feared. 4. It is a conservative procedure in hemorrhagic glaucoma, especially after occlusion of the central vein, since the operation may be repeated several times and enucleation may be prevented. 5. Secondary glaucoma resulting from discission, vitreous hernia or contusion of the eyeball need not be feared.

DR. LAWRENCE T. POST, St. Louis: I will discuss only surface diathermy and will refer to the work by Dr. W. E. Shahan and myself, which was presented in 1921. At that time we had made many studies on rabbits, using the thermophore devised by Dr. Shahan. We reported those studies and studies made in 40 human cases. (Thermophore Studies in Glaucoma, Am. J. Ophth. 4: 109 [Feb.] 1921.) These were cases of chronic simple glaucoma. The temperature used was 145 F., applied for five minutes astride the limbus, with a contact surface of 7 by 4 mm. The tension in these cases was uniformly reduced, but the effect lasted only six to twelve weeks. There was no damage done to any of the eyes. Sections of the eyes of the rabbits showed that the effect produced was a reduction in the size of the ciliary body over the heated region and, we believed, in its output. This is a controllable method of application of heat. We did not continue this because of its permanent ineffectiveness and because we found that it was not helpful in congestive types, in absolute glaucoma or in the late phases of simple glaucoma. The tension in the control eye of the patient was reduced similarly to that of the treated eye, but less, for a period of about one week, which would indicate that the neurologic connection had something to do with the effectiveness of the treatment. Is the application of the solid carbon dioxide, which I understand must be at a given temperature, effective in these late cases?

DR. GIAMBATTISTA BIETTI, Pavia, Italy: Since at times only a transient or a limited lowering of the eye pressure is required, the nonperforating methods, especially solid carbon dioxide cauterization, which are undoubtedly the least destructive, still deserve to have their place in the treatment of glaucoma, following the lines I have traced. Moreover, solid carbon dioxide cauterization and superficial cyclodiathermy, because of their harmlessness if properly applied and because of the possibility of a practical unlimited repetition, may always be tried before more complicated and dangerous procedures, which if necessary can be done later, are performed. In many cases of painful absolute glaucoma, the two methods just mentioned, although unable to control the ocular tension completely, may reduce or abolish the painful symptoms. Regarding the severity of action of solid carbon dioxide, I know that by using this method serious changes to the eye, which may even reach the stage of phthisis bulbi, can be produced. I saw this in rabbits. The severity of action depends on the intensity of the cauterization, but this severity is easier to obtain with diathermy than with solid carbon dioxide. The most important point is that, while with diathermy one always more or less destroys the tissues by coagulating them even slightly, one cannot do this primarily by freezing. Only nervous and epithelial elements, which are of foremost importance in the aqueous secretion, are sensitive to cold, and other changes are secondary to vascular ones and are probably nervous in origin. For that reason the final effects of solid carbon dioxide cauterization are more selective and milder than those obtained with diathermy, as I was able to see by using it in cases of retinal detachment. It was for this reason that I was encouraged to employ freezing in glaucoma. The idea of using electrolysis instead of diathermy for operations on the ciliary body is gaining favor and represents an advance over previous diathermic procedures. There are a few points which are still open to discussion. The first point is whether catolysis, as advocated by Dr. Berens, or anolysis, which Schreck and I prefer, is the better method. Schreck advocates anolysis because the acid coagulation is more circumscribed and hemostatic than the alkaline one, which is a colliquation necrosis, but according to Dr. Berens it seems more difficult to remove the needle from the sclera after perforating anolysis than after perforating catolysis. The second point is whether the field of application of cycloelectrolysis should be enlarged. Perforating methods were suggested especially for some cases in which previous operations have failed or are expected to fail. Ophthalmologists must consider now the possibility of adding electrolytic coagulation to the performance of ordinary cyclodialysis, since the often transient results of cyclodialysis may be enhanced by the production not of a simple but of an electrolytic fistula between the anterior chamber and suprachoroidal space. I do not think this procedure should be particularly dangerous for the lens, since there are no heating effects with electrolysis. Injuries of the lens have never occurred in Schreck's and my own experience.

CHOICE OF ANESTHESIA FOR PATIENTS WITH PULMONARY EMPHYSEMA

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Pulmonary emphysema is often a concurrent finding in patients requiring anesthesia for surgical intervention. It has plagued anesthesiologists for many years, either known to to them or otherwise,[1] yet little has been written with regard to the management of these patients. The haphazard approach to this problem can be shown, perhaps, by the routine handling of such patients in our own institution. Until the present time the diagnosis of emphysema was made on the basis of a routine physical examination. A roentgenogram of the chest and an electrocardiogram may have provided additional data, but, on the whole, no definite approach to the problem of emphysema had been made in our hospital until a fatality occurred. We felt that this death was partially related to the management of the anesthesia in a patient demonstrating chronic hypertrophic pulmonary emphysema.

A review of previous records of patients with pulmonary emphysema usually revealed that adequate preanesthetic study was lacking. No attempts were made to classify the type of emphysema. Medications often were not pharmacologically sound in principle. The anesthetic agents and technics frequently were not

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1. Rubin, E. H., and Rubin, M.: Diseases of the Chest, Philadelphia, W. B. Saunders Company, 1947, p. 416.

wisely chosen, and the anesthesia was often complicated by respiratory and circulatory derangements. In addition, these patients experienced a stormy convalescence. The purpose of this presentation is to review clinically the problem of pulmonary emphysema from the standpoint of the anesthesiologist.

CLASSIFICATION OF PULMONARY EMPHYSEMA

Emphysema (from the Greek "to inflate") is a loose term applied to several apparently related pulmonary entities, which can be differentiated etiologically, pathologically and physiologically into separate categories. This is of import to the anesthesiologist since each of these conditions presents different clinical problems for him. A patient may exhibit more than one type of emphysema; however, for purposes of differentiation it is wise to discuss them as separate pathologic conditions. There have been a number of classifications of emphysema outlined by various authors.[2] We have attempted to simplify these classifications and outline one which may be applicable to the needs of an anesthesiologist. This classification recognizes five types of pulmonary emphysema: interstitial, compensatory, senile or postural, functional obstructive and chronic hypertrophic.

Interstitial pulmonary emphysema[3] is characterized by an escape of air from ruptured alveoli into the connective tissue stroma of the lung. This air migrates along the perivascular sheaths into the mediastinum and extends to the neck and the subcutaneous tissues. Mechanical tracheal obstruction and cardiac tamponade are the factors of import from the standpoint of the anesthesiologist.

Compensatory (complemental)[4] emphysema is a simple overdistention or physiologic enlargement of the pulmonary tissues.[5] This is brought about by collapse, fibrosis or resection of the lung. The elastic properties of the lung are not disturbed. The mechanical efficiency of the lung may be somewhat impaired, but the alveolar diffusion of gases remains practically undisturbed.[6]

Senile or postural (atrophic) emphysema[7] is observed in elderly persons as a result of changes in the bony components of the thoracic cage.[8] In this condition the lung collapses readily whenever the chest is opened. There is no change in the elastic tissues of the lungs; however, the alveolar vesicles are larger than normal because of rupture of the interalveolar septums. A moderate impairment in the diffusion of gases may arise in these circumstances, yet the characteristically normal position and excursions of the diaphragm are able to compensate to a great extent for the mechanical handicap imposed by fixation of the chest.

Functional obstructive emphysema is the pathologic picture[9] which follows bronchial obstruction and is seen in cases of dust and pollen allergies, asthma, tumors or foreign bodies and trauma to the relatively small air passages in children. This process initially is a result of spasm of the small constrictor muscles in the bronchial tree. Later, edema and congestion of the bronchial walls, or even thick exudation, may be etiologic factors. The increased intra-alveolar and negative intrathoracic pressure may produce, over a period of time, a distention and rupture of alveoli. This process is reversible to some extent inasmuch as the elastic tissues of the lungs do not undergo degenerative changes. The permanent disruption of alveolar septums will remain; however, blood vessel changes in the lung are not marked, and cor pulmonale is seen only in the more advanced manifestation of this type of emphysema. Hypertrophy of the entire heart may occur in some persons. From the standpoint of anesthesia, gaseous exchange and diffusion may be greatly impaired during an exacerbation of the existing process but improve on remission of the acute attack.

Chronic hypertrophic pulmonary emphysema[10] is the classic picture of pulmonary emphysema. This condition is probably produced by long-standing pulmonary infection. Pathologic changes include a fibrosis of the normal elastic components of the lung, perivascular fibrosis and bronchiolar obstruction enhanced by the presence of profuse tenacious secretion. The distended lung flattens the diaphragm and limits its excursions. Respiration is chiefly thoracic in nature, with pronounced activity of the accessory muscles of respiration. The chest therefore seems fixed in inspiration. Expiration is prolonged and forceful. Alveolar ischemia secondary to atrophic septums and fibrotic changes in the pulmonary vessels lead to right venticular strain and cor pulmonale.[11] Anoxic anoxia of varying degree is present in chronic hypertrophic pulmonary emphysema. This hypoxia becomes more pronounced as the disease progresses and serves as a stimulus to respiration through the carotid body reflex in more severe cases.[12] The carbon dioxide tension is increased in the alveoli and the arterial blood. This increase has little effect on the respiration of these patients when compared with the response to carbon dioxide excess in the normal patient. Chronic hypertrophic emphysema, therefore, is the most difficult type with which the anesthesiologist has to deal. He encounters inefficient ventilation, slowed gaseous diffusion, bizarre respiratory phenomena and copious secretions in the tracheal bronchial tree.

PHYSIOLOGIC CHANGES

The mechanical aspects of pulmonary function[13] or the movement of gases to and from the alveoli may be disturbed to some degree in all forms of emphysema; the physiochemical processes of gaseous diffusion may be altered; and various degrees of cardiocirculatory impairment may be present. Finally, a combination of these three factors is possible. A properly or improperly administered anesthetic may result in the diminution or potentiation of these physiologic disturbances.

The complete physiologic picture in the different types of pulmonary emphysema, especially with relation

2. (a) Cecil, R. B.: A Textbook of Medicine, ed. 7, Philadelphia, W. B. Saunders Company, 1947, pp. 970-971. (b) Barach, A. L.: Physiological Methods in the Diagnosis and Treatment of Asthma and Emphysema, Ann. Int. Med. **12**: 454, 1938-1939. (c) Kountz, W. B., and Alexander, H. L.: The Mechanism of Non-Obstructive Emphysema, J. A. M. A. **100**: 551 (Feb. 25) 1933. (d) Moore, R. A.: A Textbook of Pathology, Philadelphia, W. B. Saunders Company, 1947, p. 871. (e) Boyd, W.: A Textbook of Pathology, ed. 4, Philadelphia, Lea & Febiger, 1943, pp. 445-447. (f) Barach, A. L., and Garthwaite, B.: Physiologic and Antibiotic (Penicillin) Therapy in Hypertrophic Pulmonary Emphysema, Dis. Chest **13**: 91, 1947.

3. (a) Macklin, M. T., and Macklin, C. C.: Malignant Interstitial Emphysema of the Lungs and Mediastinum as an Important Occult Complication in Many Respiratory Diseases and Other Conditions, Medicine **23**: 281-351, 1944. (b) Boyd,[2e] p. 447.

4. Moore,[2d] p. 873.

5. Rubin and Rubin,[3] p. 429.

6. Lester, C. W.; Cournand, A., and Riley, R. L.: Pulmonary Function after Pneumonectomy in Children, J. Thoracic Surg. **11**: 529, 1942.

7. Boyd,[2e] p. 447.

8. Kountz, and Alexander,[2c] p. 551.

9. Barach,[2f] p. 454.

10. Christie, R. V.: Elastic Properties of Emphysematous Lungs and Their Clinical Significance, J. Clin. Investigation **13**: 295, 1934.

11. Kountz, W. B.; Alexander, H. L., and Prinzmetal, M.: The Heart in Emphysema, Am. Heart J. **11**: 163-172, 1936.

12. Comroe, J. H., Jr., and Schmidt, C. F.: Part Played by Reflexes from Carotid Body in Chemical Regulation of Respiration in Dog, Am. J. Physiol. **121**: 75-97, 1938.

13. Cournand, A., and Richards, D. W., Jr.: Pulmonary Insufficiency, Am. Rev. Tubere. **44**: 26-41, 1941.

to the various agents and technics employed during anesthesia, to our knowledge has not been adequately investigated. Basic studies on the problem of pulmonary emphysema, however, can result in a rational approach to anesthetic problems in these patients.[14]

Pulmonary emphysema should be suspected in any patient having a history of dyspnea on exertion, a chronic cough, asthma or evidence of a "barrel-shaped" chest. In addition to the routine hospital work-up the patient should have a fluoroscopic examination to establish the position and motility of the diaphragm; a roentgenologic examination to show not only the degree of atrophic changes in the vertebrae and ribs but also the size and contour of the heart as well as the aeration of the lungs and an electrocardiographic study and determination of the circulation time to rule out cardiac involvement. In hospitals that have adequate laboratory facilities determination of the oxygen saturation of arterial blood and of the tensions of oxygen and carbon dioxide may add further knowledge concerning the degree of alveolar insufficiency. A measurement of vital capacity is simple to carry out and is of significance at any age if it is less than 60 per cent of the standard as calculated from the surface area.[15]

The accumulated data will aid the anesthesiologist to classify the emphysema into one or more of the types described. It may then be possible to proceed with the preoperative preparation of the patient as well as with the choice of preanesthetic medication and the anesthesia per se. Bronchial infection, cardiac decompensation and acute exacerbations of the emphysema demand preliminary medical treatment. Elective surgical procedures in these circumstances should be postponed until the patient is in optimum condition.

ANESTHESIA

Preanesthetic medication should include relaxation of the bronchial musculature by the judicious use of theophylline and, if necessary, nebulization of a 1:100 dilution of epinephrine or of 1 per cent phenylephrine hydrochloride (neo-synephrine hydrochloride®) the evening and morning before the operation. The reduction of reflex irritability is best accomplished in emphysematous patients by employing moderate amounts of isonipecaine (demerol hydrochloride®). Morphine and other opiate derivatives are best omitted or used with extreme caution. Oversedation with a short-acting barbiturate should also be avoided. The tendency for opiates and barbiturates to induce bronchospasm and raise the respiratory threshold to normal stimuli is well recognized.[16] Either atropine or scopolamine is employed to control salivary and mucous secretion.

The actual conduct of the anesthesia is based on several important fundamental principles. An induction characterized by excitement will lead to increased oxygen demand and subsequent hypoxia. It is preferable to employ a barbiturate such as hexobarbital (evipal®) or thiopental sodium (pentothal sodium®) intravenously to obviate this possibility. Although routine endotracheal intubation is not needed, an adequate control of the airway and frequent aspiration of the tracheobronchial tree may make such a procedure desirable. In the event intubation is deemed necessary, hexobarbital and *d*-tubocurarine chloride have proved to be efficacious in our hands.[17] Topical anesthesia of the pharynx and larynx is optional.

Twenty-five to 30 per cent oxygen is desirable for the maintenance of anesthesia. This concentration allows a margin of safety and will not produce apnea (with subsequent rise of carbon dioxide) in a chronically suboxygenated patient who is suddenly exposed to oxygen. In addition, it is not likely to produce the disorientation and excitement postoperatively that may occur with high concentration of oxygen.[18]

Most of the inhalation anesthetic agents seem to be well tolerated in patients with pulmonary emphysema. The induction, however, is generally slow, marked by excitement and a rise in blood pressure.[19] Cyclopropane should be administered with caution in persons with active signs and symptoms of bronchospasm. This agent would be an unwise choice for the patient who has received any one of the sympathomimetic bronchodilators with the exception of neo-synephrine hydrochloride®.[20] Ether will prolong the recovery period for several hours and may permit the accumulation of tracheobronchial secretion. Nitrous oxide or ethylene with 20 to 30 per cent oxygen is well tolerated. Two and a half per cent thiopental sodium or 5 per cent hexobarbital when combined with nitrous oxide is satisfactory for induction. Maintenance of the anesthetic with thiopental sodium in 0.1 to 0.2 per cent concentrations in our experience has not led to bronchospastic phenomena. In the event relaxation is required, one of the curare preparations in suitable dosage may be employed with any of the aforementioned agents.

All anesthetic technics, on the other hand, are not well tolerated in patients with pulmonary emphysema. Spinal and epidural anesthesia, whether it be single injection or fractional in type, is poorly tolerated. The paralysis of any of the accessory muscles of respiration, especially the abdominal muscles, not infrequently leads to a hypotensive state and bizarre respiratory difficulties. One must recall that this type of patient utilizes his abdominal muscles actively during respiration. When this component is removed, cyanosis and dyspnea rapidly appear. The hypotension is not at all times readily controlled by the administration of oxygen and sympathomimetic agents.[21] Other types of regional anesthetic technics are not characterized by these hazards and may be indicated for the cooperative patient.

For obvious reasons, the open drop inhalation technic is a poor choice. The combined use of the intravenous and semiclosed inhalation technics, on the basis of our clinical experience, leads to less variation of pulse, blood pressure and respiration.[22] Whether or not nitrogen retention has any relationship to this remains speculative. After fifteen minutes, this method can be changed to the closed carbon dioxide absorption technic if desired. Ether or cyclopropane, if not contraindicated, may then be employed as supplemental agents.

14. (*a*) Cournand, A.; Brock, H. J.; Rappaport, I., and Richards, D. W.: Disturbance of Action of Respiratory Muscles as a Contributing Cause of Dyspnea, Arch. Int. Med. **57**:1008-1026 (May) 1936. (*b*) Cournand, A.; Dickinson, W. R., Jr., and Darling, R. C.: Graphic Tracings of Respiration in Study of Pulmonary Disease, Am. Rev. Tuberc. **40**:487-516, 1939. (*c*) Parker, R. L.: Pulmonary Emphysema: A Study of its Relation to the Heart and Pulmonary Arterial System, Ann. Int. Med. **14**:795, 1940. (*d*) Goggio, A. F.: The Abnormal Physiology of Chronic Pulmonary Emphysema: Three Contrasting Illustrative Cases, New England J. Med. **231**:672, 1944.

15. Rubin and Rubin,[1] p. 419.

16. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics, New York, The Macmillan Company, 1947, pp. 133 and 200.

17. Volpitto, P. P., and Benton, C. C.: Evipal Sodium-*d*-Tubocurarine Chloride for Endotracheal Intubation, to be published.

18. Barach, A. L.: Emotional Control: Effect of Anoxia and of Oxygen Therapy, M. Clin. North America **28**:704-717 (May) 1944.

19. Boyd,[1] Kountz and Alexander,[5] Barach.[5]

20. Orth, O. S.; Leigh, M. D.; Mellish, C. H., and Stutzman, J. W.: Actions of Sympathomimetic Amines in Cyclopropane, Ether, and Chloroform Anesthesia, J. Pharm. & Exper. Therap. **87**:1-16, 1939.

21. Christie,[10] Kountz and others,[11] Comroe and Smith.[12]

22. Footnotes 13 and 14.

The supportive therapy during the operation does not materially differ from that of any other surgical patient. Adequate blood and crystalloid fluid replacement is naturally indicated. Theophylline may be added to the intravenously administered fluids if needed.

POSTOPERATIVE CARE

The postoperative course of patients having moderate to severe pulmonary emphysema is notably stormy. The sudden termination of anesthesia with a high oxygen concentration may precipitate an excitement followed by a variable period of disorientation and noncooperativeness. This may be true especially in the instance of rapidly eliminated agents such as cyclopropane, vinyl ether (vinethene®), hexobarbital and thiopental sodium when used alone with high oxygen concentrations. Suction by means of a long urethral type soft rubber catheter passed nasally into the trachea is indicated in the event tracheobronchial secretion accumulates. Bronchoscopic aspiration must be utilized if catheter suction is ineffectual. Naso-oropharyngeal oxygen therapy should be employed in any patient presenting symptoms of hypoxia. An oxygen flow of 6 to 8 liters per minute is sufficient. The discontinuation of the administration of oxygen should be gradual. Bronchodilator therapy and the use of antibiotics should continue for several days postoperatively. Early ambulation, passive turning, coughing and deep breathing exercises are indicated.

SUMMARY

Patients with pulmonary emphysema present numerous problems and difficulties to the anesthesiologist. A modified classification of pulmonary emphysema is presented in order to allow the anesthesiologist better to discern and handle the situation encountered. A regimen is suggested for preanesthetic evaluation and preparation of the patient, the choice and conduct of the anesthetic per se and the immediate postoperative follow-up and care.

The approach to this problem has been a clinical one founded on basic principles. It is suggested that controlled cardiopulmonary experiments be done dealing with anesthesia in relation to patients having pulmonary emphysema to refute definitely or corroborate the conclusions reached by this clinical approach to such an important problem.

ABSTRACT OF DISCUSSION

DR. IRVING R. HAYMAN, Paterson, N. J.: As anesthesiologists, we are supposed to be well versed in the normal and pathologic physiology of respiration. Yet there is no greater threat to the practical application of this knowledge than a case of pulmonary emphysema in which ventilatory decompensation is present. Our greatest shortcoming has been in the evaluation of the importance of preoperative study and care and the postoperative therapy. The emphysematous patient who shows signs of respiratory decompensation, manifested by dyspnea on effort and cyanosis (with or without a cough), is the one to whom I am referring. A careful history and physical examination, including a determination of the vital capacity and fluoroscopy, should determine the presence and the type of emphysema. The choice of anesthetic agent and technic is still equivocal. Heretofore, I have preferred spinal anesthesia, using oxygen, under pressure if necessary, to increase vital capacity and maintain adequate oxygenation. The accessory muscles of respiration are hampered under spinal anesthesia, and the use of oxygen should compensate for this. Is the use of an extremely short-acting barbiturate for induction plus curare for relaxation any less hazardous than spinal anesthesia? If we are to accept the fact that all emphysematous patients have a narrowing of the bronchioles due to either muscle spasm or swelling of the mucous membrane or torsion of the alveolar ducts, are we wise in choosing inhalation anesthesia? However, one thing is certain, and that is that the ease with which a tracheal-bronchial aspiration is accomplished under general anesthesia gives this technic a real advantage over spinal anesthesia. If this makes for better control of the patient's respiration during operation and a smoother postoperative course, then perhaps general anesthesia is to be preferred to regional anesthesia for the decompensated emphysematous patient. In caring for the emphysematous patient, oxygen therapy should not be confined to the administration of the anesthetic agent. Oxygen should be used freely before and after operation. The fundamental response to an enriched oxygen atmosphere of a patient with pulmonary emphysema is a reduction in the volume of breathing. As a result, more time is available in which a unit of air may be exhaled. This allows for a more complete emptying of the alveolar spaces, pulmonary distention is progressively diminished, the alveolar ducts and bronchi are relatively more patent, aeration of the alveoli is better and anoxia and dyspnea are lessened.

DR. R. DOUGLAS SANDERS, Wilmington, Del.: Dr. Volpitto and Dr. Brown's subject is a timely one, in view of the fact that our population is acquiring more and more old persons, who have the worst forms of emphysema. The classification is a good one. It will need further revising in view of the necessity for acquiring a clinical indicator of the severity of emphysema. Until that time no one can compare results that are obtained with this or that method. We, for instance, tend to employ induction with nitrous oxide and maintenance with light ether, using helium if necessary. That makes three different types that have been recommended to us. We think our way is good, but it is possible that our cases are not similar to the worst cases that Dr. Volpitto has seen. In the preanesthetic preparation of the patient, one of the most important factors is to stop him from smoking so that the quantity of his secretions may be reduced. Penicillin dust and aerosol over a period of days are distinctly helpful in reducing them, too. Roentgenologic determinations should be made by the person who is giving the anesthesia. You should require the skill that is necessary to make roentgen evaluation, because when you send a patient to the x-ray department and ask, "How bad is his emphysema?" it is of no help if he comes back with a report that means absolutely nothing to you from a functional standpoint. It was a surprise to me to hear Dr. Volpitto mention the use of evipal® with *d*-tubocurarine. I thought that evipal® was a forgotten drug in this country. It may be that he has something distinctly helpful there, because of the fact that it is not depressant in its effect on the respiration as pentothal sodium® is.

DR. PERRY P. VOLPITTO, Augusta, Ga.: In reference to Dr. Hayman's remarks about spinal anesthesia, I concede that this is a controversial subject. Some of the patients who do not have moderate to severe chronic hypertrophic emphysema or asthma will probably tolerate this type of anesthesia well. In the more severe types of emphysema, even though controlled breathing with high concentration of oxygen may be utilized, bizarre circulatory phenomena occur which may be annoying. For example, one of our patients was given an anesthetic for an abdominal surgical procedure on two separate occasions. The first time he was given cyclopropane-ether by the carbon dioxide absorption technic. The induction was stormy and prolonged. There was a considerable rise in blood pressure, followed by a protracted emergence excitement. At the second operation this patient was given a fractional spinal anesthesia. He was given 50 mg. of 3 per cent procaine initially, preceded by 50 mg. of ephedrine sulfate intramuscularly. Within less than ten minutes of the administration of the procaine his blood pressure dropped from 150 systolic and 90 diastolic to 60 systolic and 50 diastolic. We had considerable difficulty in stabilizing his blood pressure. When this was accomplished, we gave him 25 mg. of procaine. Another precipitous drop in blood pressure occurred. A similar drop in blood pressure is observed in patients who are asthmatic, even though the attack may be of

an extremely mild form. This circulatory phenomenon at times becomes exceedingly difficult to manage. Evipal sodium[9] with *d*-tubocurarine chloride in our hands has proved less troublesome than pentothal sodium[9] with *d*-tubocurarine chloride for emphysematous patients. Dr. Sanders has referred to a possible revision of the classification of emphysema. I thoroughly concur with this, inasmuch as revisions of such classifications are undoubtedly necessary from time to time, especially if other persons become interested in patients of this type and do some experimental work. Controlled cardiopulmonary laboratory studies are needed utilizing various anesthetic technics in order to give us definite data, and it is hoped that this can be done sometime in the not too distant future.

Clinical Notes, Suggestions and New Instruments

GUSTATORY HYPERHIDROSIS OF THE LEFT KNEE

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and
JUNE MELLINKOFF, R.N.
Philadelphia

Paroxysmal sweating localized to one asymmetric area of the body may occur in a variety of neural lesions[1] and sometimes without demonstrable cause.[2] Symmetric sweating of the face, or parts of the face, accompanying eating is a matter of common experience and was reported to the *Société de Biologie* by Brown-Séquard.[3]

Asymmetric gustatory[4] sweating of the face, however, is a somewhat more unusual phenomenon and was first described by Baillarger in 1853.[3] In 1946 Langenskiöld analyzed 90 cases of this syndrome that had been reported in the literature and added 2 cases of his own.[3] All these patients had suffered some sort of injury to a localized area of the head, face or neck, commonly a necrotizing infection of the parotid gland, or had some disease, like syringomyelia, thought to have damaged the nerve supply to a portion of the skin. Eating or drinking was then accompanied with excessive perspiration in the area in which the nerve supply had been impaired. Langenskiöld offered what he believed to be a satisfactory explanation for this distressing symptom: the preganglionic sympathetic fibers governing sweating had been destroyed; thus, according to Cannon's law,[5] the postganglionic cholinergic fibers were rendered hyperexcitable, and during mastication acetylcholine elaborated in the parotid gland "diffundated" to the nerve endings in the skin and produced sweating.

We were unable to find a report of any patient in whom gustatory asymmetric hyperhidrosis occurred below the neck. Because of its implications in pathogenesis, we decided, therefore, to describe the following instance of such a condition.

REPORT OF CASE

S. H. M., a robustly healthy and perfectly normal female infant, began to crawl extensively at the age of 8 months. Shortly afterward the child's mother noticed a curious sequence of events: whenever the little girl was given milk, by bottle as usual, an area of skin about 2½ inches (6.4 cm.) in diameter around the left tibial tubercle became covered with beads of moisture. The perspiration commenced after several minutes of sucking, and within another two or three minutes became so intense that rivulets of sweat ran down the child's leg. It was clear from inspection that visible sweat was being formed only over the left knee. At first it was suspected that this phenomenon was related in some way to the position in which the baby was held, to temperature peculiarities or drafts in the room, or to unnoticed wiping away of sweat in other regions. When great care was taken to insure against any of these possible sources of confusion, however, it was unmistakably evident that the original observation had been correct. Localized hyperhidrosis occurred only while the baby was nursing and slowly disappeared afterward, when the baby was fed solid foods. Yet this phenomenon recurred as the child received each bottle of milk. There was normal diffuse sweating when the child exercised, but neither unusual dryness nor moistness of any part of the body was seen or felt under any circumstances apart from those already mentioned. Between meals the skin was everywhere perfectly normal. The baby's temperature, pulse rate and respiratory rate were normal, and physical examination revealed a cheerful, active, well-nourished girl.

In the two weeks following the onset of the hyperhidrosis the baby learned to raise herself to her feet by grasping the furniture with her hands. This gave her knees a well-earned rest for a part of each day, and slowly the peculiar sweating ceased. During the last day on which it was regularly observed, sweating was never sufficiently intense to cause liquid to roll down the leg. Sometimes tiny beads of moisture were visible, and once there was only a difference in texture of the skin over the two knees. There had been no great changes in the weather during this period, the humid heat of August having been present all the time.

COMMENT

How can one explain this fleeting gustatory hyperhidrosis in a part of the body anatomically and physiologically so remote from the salivary glands? We have no proof of any mechanism, but venture the following guess: Crawling traumatized the superficial nerves over the left knee. Irritative neural lesions can cause steady hyperhidrosis,[6] but in this case it seems likely that the cholinergic fibers were merely rendered hypersensitive to acetylcholine. Then, when vagus stimulation occurred with nursing, acetylcholine in increased amounts was disseminated by the blood stream. Only the hypersensitive fibers of the traumatized area responded. It has been amply demonstrated in animals that increased amounts of acetylcholine are found in the blood after parasympathetic stimulation and that in such circumstances cholinergic structures deprived of nervous inhibition will respond in an exaggerated manner.[7]

Why the right knee was not affected is not certain. It seemed to the parents that the baby more often put pressure on the left knee as she attempted to grasp objects with the right hand. The left knee apparently healed as the child learned to walk and the knee was irritated less. It is interesting that sucking milk produced the sweating, while sucking orange juice or apple juice or eating solids had no such effect. It seems that the ingestion of milk alone was a sufficiently powerful vagus stimulant.

It has been suggested that a peptic ulcer might cause a similar hypersensitivity to acetylcholine, and it has been demonstrated that peptic ulceration may, indeed, damage the plexuses of Meissner and Auerbach.[8] It is interesting to speculate on such possibilities in the light of the present case, which seems to demonstrate injury-induced hypersensitivity to acetylcholine in a visible end organ.

From the Gastro-Intestinal Section (Kinsey-Thomas Foundation) of the Medical Clinic, Hospital of the University of Pennsylvania.

1. Wechsler, I.: A Textbook of Clinical Neurology, Philadelphia, W. B. Saunders Company, 1943, p. 678. Bucy, P. C., and Pribram, K. H.: Localized Sweating as Part of Localized Convulsive Seizure, Arch. Neurol. & Psychiat. **50**: 456 (Oct.) 1943.

2. Tarlov, I. M., and Herz, E.: Unilateral Frontal Hyperhidrosis Relieved by Supraorbital Nerve Section, J. A. M. A. **132**: 476 (Feb. 15) 1947.

3. Langenskiöld, A.: Gustatory Local Hyperhidrosis Following Injuries in the Parotid Region, Acta chir. Scandinav. **93**: 294, 1946.

4. Sweating that occurs during a meal has, in the literature, been called "gustatory." Whether the sweating is a consequence of tasting, swallowing, the presence of food in the stomach or a combination of factors is not known. Perhaps the syndrome should be called "prandial hyperhidrosis."

5. Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice, Baltimore, Williams & Wilkins Company, 1945, p. 947.

6. Grinker, R. R.: Neurology, Springfield, Ill., Charles C Thomas, Publisher, 1934, p. 266. Telford, E. D.: Cervical Rib and Hyperhidrosis, Brit. M. J. **2**: 96 (July 25) 1942.

7. Dale, H. H., and Feldberg, W.: The Chemical Transmitter of Vagus Effects to the Stomach, J. Physiol. **81**: 320 (June 9) 1934. Best and Taylor.[5]

8. Bockus, H. L.: Gastroenterology, Philadelphia, W. B. Saunders Company, 1944, p. 338.

SUMMARY

1. A case of gustatory hyperhidrosis of the left knee is described in an infant 8 months of age.

2. It is suggested that crawling traumatized the cholinergic nerves, making them hypersensitive, and that sweating occurred when acetylcholine was disseminated by the blood stream following vagus stimulation.

PERIPHERAL, OR FIVE POINT, METHOD OF SKIN BIOPSY

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PERRY M. SACHS, M.D.
and
SAM C. ATKINSON, M.D.
New York

The use of the biopsy is a well established and accepted method for the diagnosis of cancer of the skin. Frequently, the types of epitheliomas can be differentiated clinically, but histologic corroboration should be obtained in all cases. With ordinary basal and prickle cell epitheliomas the usual methods of treatment with roentgen rays, radium, excision, desiccation or combinations of these are adequate. When recurrent lesions, infiltrating and disseminating neoplasms, anaplastic epitheliomas or early nevocarcinomas are present, more accurate and scientific microscopic estimation of the invasiveness of the cancer is necessary for determination of optimal treatment and for minimization of recurrences and failures.

Heretofore, too little emphasis has been placed on the study of the extensiveness of a lesion, and too much of this information depends, for the most part, on clinical appearance and the judgment of the physician performing the operation. At times, the true limits of a neoplasm do not correspond to the apparent edge. Thus, microscopic study of the estimated normal skin at the periphery may reveal cancer cells and help to eliminate the possibility of inadequate destruction and recurrence.

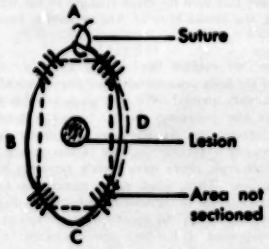

Fig. 1.—Diagram for a peripheral, or five point, biopsy on an average size lesion (method 1). *A*, *B*, *C* and *D* represent the four poles of the biopsy specimen.

Study of serial sections would accomplish the necessary result, as extending strands or cells of the neoplasm would easily be discovered. However, this procedure is not often feasible and with large growths is almost impossible. Furthermore, it is time-consuming and expensive, and the sections cannot be correlated with the clinical topography of the lesion.

In our opinion, a most exact and effective method is that of chemosurgery, described by Mohs.[1] Here, a fixative of zinc chloride is applied to the lesion for several hours; the lesion is then removed with a scalpel, and frozen sections are made, stained and examined for malignant cells. The process is continued until healthy tissue is reached. In some large, ulcerated lesions, after all other therapy has failed, cures have been obtained with chemosurgery. However, this method necessitates special setup, training and technic. Also, it may be unavailable to those who, because of distance or expense, cannot reach the few places where this method is in use.

For those cases in which, for any reason, it is inadvisable to employ either serial sections or chemosurgery, we would like to suggest a peripheral biopsy method that is readily accessible to everyone and that has proved to be of considerable value to us over a period of years. Tissue is removed for examination from the periphery of the lesion, that is, from the four sides and the bottom, because these are the five directions of possible spread. While, in some cases, intervening tissue will not be included in the edges of the biopsy specimen, the chance of missing the process is unlikely in the average size lesion; with large lesions, this chance may be minimized by increasing the number of peripheral biopsy specimens. This provides more than mere presumptive evidence that destruction has been complete.

The peripheral, or five point, method of skin biopsy may be accomplished in one of two ways.

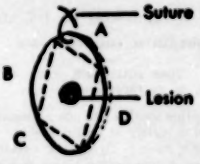

Fig. 2.—Diagram for a peripheral, or five point, biopsy on a large size lesion (method 1).

Method 1.—The lesion is removed by an elliptic incision, and one pole is oriented with a thread. A diagram of this excised tissue is made on the patient's record so that it corresponds with the exact anatomic position. The pathologist takes pieces of tissue from the four poles (fig. 1) of the biopsy specimen. When the lesion is not large, the four sides are cut to include the entire periphery (fig. 2). The underside of the rest of the lesion is sectioned parallel to the surface. In this manner, five sections are obtained (the four edges and the bottom).

Method 2.—Here, a punch specimen for biopsy is taken from apparently normal skin at each of the sides, about 2 or 3 mm. from the assumed limits of the lesion (fig. 3). After the growth is removed, the fifth specimen is taken from the center of the base. This last specimen is usually unnecessary if the lesion itself is sectioned and the deep cutis and fat are carefully examined. The entire area may be excised and the edges approximated by sutures with the object of obtaining primary union, or the wound may be desiccated and allowed to heal by granulation. All biopsy specimens must be designated correctly and placed in separate bottles, and a diagram should be made showing the relative topographic location of each.

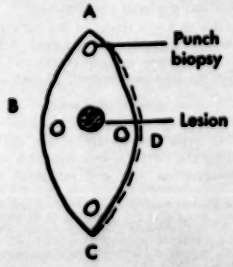

Fig. 3.—Diagram for a peripheral, or five point, punch biopsy (method 2).

If any areas show evidence of epitheliomatous extension, the process of peripheral biopsy should be repeated at these sites. This procedure is continued until only normal, noncancerous

From the Department of Medicine (Dermatology), New York Hospital and Cornell University Medical College (Dr. Wilbert Sachs and Dr. Atkinson) and the Dermatological Department of the New York Medical College, Flower and Fifth Avenue Hospitals (Dr. Perry M. Sachs).

1. Mohs, F. E.: Chemosurgical Treatment of Cancer of the Face: A Microscopically Controlled Method of Excision, Arch. Dermat. & Syph. 56:143 (Aug.) 1947.

tissue is encountered. When peripheral specimens are free of malignant cells, it is reasonable to assume that the entire epithelioma has been destroyed.

SUMMARY

The peripheral, or five point, method of skin biopsy is a combination of an office procedure and a modification of the usual pathologic study. It allows for the removal of a minimum of normal tissue with a maximum of confidence in the thoroughness of the extirpation. The method is simple, safe, painless, reasonably certain and time-saving. It is especially advantageous and useful in cases involving recurrent lesions, anaplastic epitheliomas and early nevocarcinomas.

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SATURDAY, MARCH 25, 1950

RECENT STUDIES OF IRON

The absorption and utilization of iron in the human organism is of perennial clinical interest because of the fundamental importance of, and frequent therapeutic need for, this element. The past year has brought forth several noteworthy contributions to this subject. The importance of gastric hydrochloric acid in the release of iron from food complexes has been reemphasized, as has the influence of ascorbic acid in reducing iron to the ferrous state in the stomach in human subjects.[1] Protein digestion products also appear somewhat effective in this regard. The importance of this observation lies in the fact that iron is probably most readily absorbed when in the ferrous state. Hence, ascorbic acid and dietary protein may actually increase the availability of food iron.

Another series of investigations [2] has demonstrated the role of one of the plasma globulins, the beta, fraction, in the transport of serum iron—long an unsolved problem. This iron-binding globulin has been crystallized and shown to have a molecular weight of approximately 90,000. Human plasma contains approximately 2.4 Gm. of the globulin per liter, and each gram can bind 1.25 mg. of iron. Using an ingenious colorimetric procedure, the Harvard investigators [2b] found that the iron-binding globulin of the serum of the normal adult can contain about 0.3 mg. per hundred cubic centimeters but that it is only about 34 per cent saturated with iron. Apparently a margin of safety exists for the transport of additional iron should the need arise. In cases of iron deficiency anemia the serum iron value is much less than normal, as is well known, and the iron-binding globulin is only about 9 per cent saturated. On the other hand, the degree of saturation in hemochromatosis and transfusion hemosiderosis was reported to be nearly 100 per cent, as might be expected. Thus the mechanism of iron transport in human plasma now appears to be much more clearly understood.

Still another current investigation promises to contribute materially to the understanding of the excretion of iron. The view that little or no iron is excreted in the urine and only small amounts are eliminated in the feces, probably by way of the bile, has been generally accepted. This concept visualizes the human organism as a tight compartment, as far as iron is concerned, and further implies that little or no absorption of exogenous iron into the closed space occurs other than to replace blood loss. By careful analyses of human sweat it has been observed [3] that a significant amount of iron may be excreted by this route in the normal adult male subject. Under comfortable environmental conditions, the dermal excretion of iron averaged approximately 0.3 mg. per hour, or 13 per cent of the total dietary iron intake, whereas under hot humid conditions the excretion increased to 1.3 mg. per hour, or 41 per cent of the total iron ingested. Although further confirmatory studies are perhaps necessary, these data indicate the possible major importance of sweat as a pathway of iron loss from the body. The practical implications of such a fact are obvious.

A fourth heretofore obscure problem concerning the metabolism of iron concerns the locus of its utilization in the synthesis of the heme portion of hemaglobin. This process has been presumed, with little direct evidence, to occur in the bone marrow and possibly the spleen and liver. A current in vitro study,[4] in which radioaactive iron (as Fe^{59} or Fe^{55}) was used as a tracer, presents convincing evidence that heme synthesis occurs in the immature erythrocyte itself. The rate of iron uptake is greatest in the normoblast, but even the reticulocyte shows a definite uptake. The radioactive iron was present in the recrystallized heme obtained from the hemoglobin of these cells. Of interest, too, is the fact that the addition of either folic acid or liver extract to the immature erythrocyte increased the rate of heme synthesis, as manifested by an increased rate of iron uptake.

The foregoing developments indicate the current active interest in the behavior of iron in the organism and the significant progress which is being made in the elucidation of this important problem.

1. Bergeim, O., and Kirch, E. R.: Reduction of Iron in the Human Stomach, J. Biol. Chem. 177:989, 1949.

2. (a) Surgenor, D. M.; Koechlin, B. A., and Strong, L. E.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: XXXVII. The Metal-Combining Globulin of Human Plasma, J. Clin. Investigation 28:73, 1949. (b) Rath, C. E., and Finch, C. A.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: XXXVIII. Serum Iron Transport; Measurement of Iron-Binding Capacity of Serum in Man, J. Clin. Investigation 28:79, 1949.

3. Mitchell, H. H., and Hamilton, T. S.: The Dermal Excretion Under Controlled Environmental Conditions of Nitrogen and Minerals in Human Subjects, with Particular Reference to Calcium and Iron, J. Biol. Chem. 178:345, 1949.

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THE ELECTRON MICROSCOPE

The development of the electron microscope was an important contribution to a better understanding of bacteria and viruses. While the use of this instrument is not limited to bacteriology and virology, its more apparent usefulness for those concerned with health problems lies in these fields. Like most of today's research tools, it has limitations, but these are insignificant when its full possibilities are realized. Although a comparatively recent development, the electron microscope is rapidly becoming more familiar to an increasing number of researchers in biologic, medical and industrial fields. The first such instrument was constructed less than two decades ago, and yet, in spite of their cost, a fair number of instruments are in use. Where future research with these microscopes will lead remains to be seen, but there is assurance that if the future findings are as exciting as those of the past few year they will be astounding.

A report by McFarlane[1] provides information on several phases of electron microscopy. Some of the artefacts that arise pose troublesome obstacles but at the same time emphasize the precision technics necessary for this field of microscopic exploration. Defective cleaning or alinement of the microscope, volatilized oil and metal and drying are only a few of the factors that may plague the operator of an electron microscope. Nevertheless, he has been able to study plant viruses, bacteriophages and animal viruses. The importance of studying the virus (or viruses) responsible for anterior poliomyelitis, influenza viruses, viruses of the pox group and other disease-producing organisms cannot be stressed too strongly. One important aspect of the observations made with the electron microscope is the different way in which bacteria and viruses may behave in their living and dying processes. When these variations are better understood it may be possible to explain some of the peculiar differences that arise in clinical problems.

In another recent report on electron microscopy, Haslett[2] reviews the requirements in microscopy, the limitations on resolution and a comparison of electron microscopes with optical microscopes. He points out that in outline the two types of microscopes are similar but in detail there are four essential differences: because of its size the electron microscope appears to be built upside down; between the filament and the condenser the electrons are accelerated electrically to a high speed or energy; the electron microscope is a high vacuum instrument to prevent collision of electrons with air molecules, and the specimens required for electron microscopy are much thinner.

Such is the type of information now being made available by microscopists. As the field of electron microscopy broadens, solutions to some currently vexing problems will be obtained. In the meantime it offers exciting possibilities for speculation.

1. McFarlane, A. S.: Electron Microscopy of Bacteria and Viruses, Brit. M. J. 2:1247 (Dec. 3) 1949.
2. Haslett, A. W.: An Approach to Electron Microscopy, Brit. M. J. 2:1286 (Dec. 3) 1949.

Current Comment

ADVANTAGE OF SURGICAL TREATMENT OF TUBERCULOUS CAVITIES

The opinion prevalent even among surgeons has been that thoracoplasty is safer and better than extrapleural pneumothorax and that the latter should be reserved for cases in which thoracoplasty is contraindicated. Gradually, however, extrapleural pneumothorax has been done more frequently. Seip[1] has reported on 994 patients treated surgically for pulmonary tuberculosis during 1937 to 1947, inclusive. Of these patients 539 were treated with extrapleural pneumothorax and 373 with thoracoplasty, 11 with both and 71 by other methods. As a result of this study, both extrapleural pneumothorax and thoracoplasty are considered important methods in the collapse therapy of pulmonary tuberculosis, and extrapleural pneumothorax is the preferred method unless special circumstances favor thoracoplasty. The most frequent reasons for preferring thoracoplasty are (1) the existence of a large tuberculous cavity near the lung surface, because the risk of bronchopleural fistula is great with extrapleural pneumonolysis; (2) the existence of a high degree of fibrotic contraction, eventually with bronchostenosis, and (3) sometimes remoteness of the patient from the phthisiologist, excluding possibility of frequent contact. In patients requiring operative collapse treatment on both sides better late results with far less risk followed extrapleural pneumothorax. Among the "bad and desperate risks" better late results and much lower mortality follow extrapleural pneumonolysis. However, in the presence of giant cavities mortality is high from bronchopleural fistulas if extrapleural pneumonolysis is performed and from pulmonary complications if thoracoplasty is performed. Extrapleural pneumonolysis is a less radical method than thoracoplasty and is performed in one stage, whereas thoracoplasty is usually performed in two or more stages. The bony chest wall is preserved by extrapleural pneumonolysis; the movement of the arms remains normal in practically all cases, and pains at the site of operation are uncommon. The risk of residual cavity is less after extrapleural pneumothorax treatment, at any rate unless thoracoplasty is radical and extensive. In a great number of patients, an advantage of extrapleural pneumothorax is that it is to some extent reversible, especially when new relapses occur in the nonoperated lung years later. From one point of view, a disadvantage of extrapleural pneumothorax is that refills are required regularly. Tuberculous empyemas, a disadvantage of extrapleural pneumothorax, are not severe if they do not result in

1. Seip, M.: On Treatment of Tuberculous Cavities by Extrapleural Pneumothorax and Thoracoplasty, Acta tubere. Scandinav. 1949, supp. 19, pp. 9-124.

internal fistulas or if they are not a sign of internal fistula. Bronchopleural fistulas are exceedingly serious and have been fatal as a rule. The deaths from internal fistulas were not frequent enough to interfere with successes and are counterbalanced by the greater number of residual cavities after thoracoplasty. Experience is essential to obtaining the most favorable results with extrapleural pneumothorax. Every extrapleural cavity requires frequent and careful control on the part of the surgeon and the phthisiologists. As for thoracoplasty, experience is required to determine right indications and to perform the operations, whereas the control after discharge from the hospital is not of such great importance as in cases of extrapleural pneumothorax. Most difficulty is experienced in making the choice of extrapleural pneumothorax or thoracoplasty. Experience with both is paramount in this. A department for the surgical treatment of pulmonary tuberculosis ought not to have less than 20 or 30 beds so that at least three major thoracic operations a week may be performed. Thus is stressed again the complexity not only of the surgical treatment of tuberculosis but of tuberculosis itself. It cannot be dismissed simply. The disease is still increasing in most of the world.[2]

DRUG-FAST LEUKEMIA CELLS

Drug-fastness may develop in leukemia cells according to a recent report by Burchenal and associates[1] of the Sloan-Kettering Institute for Cancer Research, New York City. Previously it had been shown that there is a decided prolongation of the survival time of mice inoculated with leukemia cells when treated with standard doses of 4-amino-N^{10}-methyl-pteroylglutamic acid. Untreated control mice die within twelve days. Treated mice often survived as long as forty days. However, all treated mice eventually die. The New York investigators wondered whether the ultimate failure of therapy with this agent may be due to the development of resistance to the drug by the leukemia cells. To test this hypothesis they made serial abdominal inoculations of leukemic splenic emulsions in treated and untreated groups of mice. Cross inoculations showed that there was no pronounced change in virulence in the leukemia cells as a result of treatment with 4-amino-N^{10}-methyl-pteroylglutamic acid. By the third serial inoculation in the treated group there was an appreciable loss of susceptibility to the drug, the treated mice dying in an average of nineteen days. By the fifth serial inoculation there was a complete loss of susceptibility to the compound. Mice inoculated with the drug-fast leukemia cells died equally promptly in the treated and untreated groups. Morphologic differences between the cells of the sensitive and resistant sublines were not observed. Histologic sections taken at the time of death from mice inoculated with the sensitive and resistant sublines appeared to be identical. Studies are now in progress in the hope that biochemical differences may be found. Demonstration of the ability of hitherto sensitive leukemic cells to develop resistance to 4-amino-N^{10}-methyl-pteroylglutamic acid may help explain the eventual failure of this type of therapy in patients with acute leukemia.

2. The Fight Against Tuberculosis, Annual Report of the National Association for the Prevention of Tuberculosis of Great Britain, 1948-1949, p. 5.

1. Burchenal, J. A.; Robinson, E.; Johnston, S. F., and Kushida, M. N.: Science 111:116 (Feb. 3) 1950.

ATELECTASIS

Atelectasis is supposed to designate a lung collapsed and empty of air, but the differences between collapsed and atelectatic lung are considerable. Xalabarder[1] defines atelectasis as the absence of air in the pulmonary alveoli with intense retraction and shrinking, the latter differentiating it from simple pulmonary collapse. As a result of the vascular dilatation characteristic of atelectasis, intra-alveolar exudates from simple serous edema to hemorrhagic suffusions are produced. Reversion is liable, but if inflammation persists a long time a progressive fibrosis results. It is curious that postmortem descriptions of pure atelectasis scarcely exist. In living man factors exist which are absent from the dead body. Radiographically signs of atelectasis are characterized by approximation of the ribs, deviation of the mediastinum and rising of the diaphragm, with functionally absolute absence of respiration. There is diminution in the size of the lung considerably more than the elasticity of the organ alone can produce. Even though experimental atelectasis may be obtained by obstructing the bronchus by means of ligatures, plugging or rubbing with silver nitrate, this observation is insufficient to warrant the conclusion that atelectasis is directly produced by cutting off the air, for the following reasons: (1) there are bronchial obstructions without atelectasis; (2) the existence of bronchial plugs is not constant; (3) in the dead body atelectatic lungs can be inflated with lower pressure than the retractile power of the living atelectatic lung; (4) all investigators note that atelectasis can be produced by obstruction of a main bronchus but not of a secondary bronchus, and (5) once the gaseous pressure on each side of the alveolar wall has become equal, the alveolus will be relaxed to the maximum limit which its elastic structure permits; that is, to that of collapsed lung—a different condition from atelectasis. Xalabarder believes that atelectasis is produced by pulmonary contraction and that it originates from several causes acting on a specially predisposed organ. One of these causes may be bronchial obstruction, but this is not an indispensable factor. Atelectasis is the abnormal exaggeration of the physiologic pulmonary tone and has been underestimated in the lung. This defective function is of importance in the genesis of other pulmonary phenomena including the active dilatation of the lung (insatiable pneumothorax and functional emphysema). Xalabarder accepts the existence of muscular fibers in the alveolar walls and sees in the functioning of these muscular plexuses, under regulation by the autonomic nervous system, the solution to a regional contracture in the affected pulmonary zone, that is to say, to atelectasis.

1. Xalabarder, C.: What Is Atelectasis? Tubercle 30:266-283, 1949.

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ORGANIZATION SECTION

Official Notes

LETTER FROM DR. LOUIS H. BAUER

The letter dated March 7 from Dr. Louis H. Bauer, Chairman of the Board of Trustees of the American Medical Association, sent to all members of the Association, was not a notice as to collection of dues. It was to inform the members of the Association's activities and was sent to every member of the Association regardless of the status of his dues.

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES

The Board of Trustees of the American Medical Association held meetings in the headquarters of the Association on February 9, 10 and 11, following a meeting of the Executive Committee on February 9. Some of the proceedings are here reported:

Change in Name of Cooperative Medical Advertising Bureau

The Board, on recommendation of the Advisory Committee to the Cooperative Medical Advertising Bureau, voted to change the name of that Bureau to "State Journal Advertising Bureau of the American Medical Association." In the opinion of the Committee the word "cooperative" indicates that the Bureau cooperates with all medical publications and it has had applications for membership from publications that do not qualify under the operative principles of the Bureau.

Appointments

The following appointments were made by the Board:

Dr. Gunnar Gundersen, La Crosse, Wisconsin, Chairman of the Executive Committee of the Board of Trustees

Dr. Walter B. Martin, Norfolk, Va., member of the Executive Committee to fill the vacancy caused by the resignation of Dr. James R. Miller, Hartford, Conn.

Dr. Robert B. Larson of Winston-Salem, N. C., to the Editorial Board of the *American Journal of Diseases of Children*

Dr. E. B. Howard to the Steering Committee of the Advisory Council on Participation of National Organizations of the National Committee for the Midcentury White House Conference on Children and Youth

Mr. George Cooley as staff associate to the Commission on Chronic Illness

Dr. F. F. Borzell and Dr. William Bates to the Fifty-Fourth Annual Meeting of the American Academy of Political and Social Science

Dr. D. H. Murray to the celebration of the one hundredth anniversary of the founding of the University of Utah

Dr. Rustin McIntosh and Dr. L. H. Bauer to the American Council on Rheumatic Fever

Dr. Joseph Lawrence to the Fifth National Conference on Citizenship of the National Education Association

Brig. Gen. Guy B. Denit to the Annual Meeting of the British Medical Association

Dr. T. P. Murdock to the National Committee for the Improvement of Nursing Services

Dr. R. R. Spencer to succeed Dr. Ludvig Hektoen as a member of the American Documentation Institute for a term of three years

Dr. McKinnie L. Phelps, Denver, additional member of the Coordination Committee on Legislation

Dr. Joseph Hayman, Cleveland, to succeed Dr. Robert F. Loeb (resigned) on the Council on Pharmacy and Chemistry.

The Chairman of the Board appointed Dr. Deering Smith of Nashua, N. H., and Dr. Julian P. Price, Florence, S. C., to replace Dr. Harvey B. Stone, who resigned, and Dr. Frank H. Lahey, who was appointed but could not accept, on the Coordination Committee on Legislation.

Council on National Emergency Medical Service

The Board accepted with regret the resignation of Dr. Richard L. Meiling from the Council on National Emergency Medical Service because of pressure of his duties as Director of the Office of Medical Services, Office of the Secretary of Defense.

The employment of Capt. Robert M. Hall as full time Secretary of the Council on National Emergency Medical Service was approved.

Resignation of Dr. Miller

The Board also regretfully accepted the resignation because of ill health of Dr. James R. Miller as a member and Chairman of the Executive Committee.

Exhibits for National and State Organizations

The Board approved the sending of exhibits from the headquarters of the Association to:

National Tuberculosis Association, Washington, D. C., April 24-28
Missouri State Medical Association, St. Louis, March 26-29
Farm and Home Week, College of Agriculture, University of Wisconsin, Madison, January 30-February 2
Florida Medical Association's Seventy-Sixth Annual Meeting, Hollywood, Fla., April 23-26
Tennessee State Medical Association, Annual Meeting, Memphis, April 10-12
Allegheny County Medical Society
Hall of Springs at Saratoga Spa
Hall of Exhibits of Washington State Medical Association, September 10-13

Special Subscription Rate for Resident Physicians

Authorization was given for a special subscription rate on THE JOURNAL for resident physicians. The rate, $9 per annum, is the same as is granted to students and interns.

The following definition of a "resident physician" was adopted:

"A 'resident physician' is one who is in hospital training for a specialty or for general practice and who has been out of medical school not more than five years."

Permission Given for Reproduction of Articles from The Journal

Permission was given for the republication of not more than two articles a month from THE JOURNAL in a French periodical published by A. Albarranc and in *El Dia Médico*, published in Buenos Aires, the purpose being to keep the French and South American doctors informed of the scientific and medical advances in this country.

Blanket permission has been given to the Chief of the Field Publications Section of the Department of State to reprint articles from THE JOURNAL for overseas distribution for another year.

Completion of Chemical Laboratory

The Board authorized the completion of the construction work in the Chemical Laboratory, at a cost of approximately $28,000.

New Quarters for Washington Office

Authorization was given for the renting of larger office space for the Washington Office, which henceforth will be located at 1523 L Street Northwest, Rooms 300-312, Washington, D. C.

Conference of Chief Editors of Special Journals

A conference prior to June of chief editors of the special journals published by the Association was authorized.

Exemptions from Payment of Dues

The following decisions were made by the Board in regard to physicians who shall be exempt from the payment of dues to the Association:

(1) The county society shall determine when the payment of dues is a hardship, but in no case will the payment of American Medical Association dues be exempted unless the payment of county and state dues also is exempted.

A person in actual training for not more than five years after his graduation from medical school will be exempted, provided he is also exempted from state and county dues.

(2) The dues of a physician who joins his county society after July 1 will be $12.50 for that year; if he joins before July 1 his annual dues will be $25.

(3) A physician who transfers from one state or county to another will not be expected to pay the dues a second time;

that is, he will not be expected to pay them in the state or county to which he has removed his practice if he paid them in the state or county from which he moved.

Reimbursement of State Societies for Collection of Dues

The Board took the following action with respect to reimbursing state societies for collecting the dues of the Association:

For this year, and this year only, because the dues were established by the House of Delegates so late, the Association will be responsible for the actual expense involved in collecting dues for the Association, not, however, to exceed 10 cents per dues-paying member at the state level.

It is proposed to establish the dues at the annual session, which will give every state secretary time to prepare statements including the state and the American Medical Association dues; hence the Board sees no reason for the incurring of expense by the states after the current year, inasmuch as the bills should be sent out with those for state dues.

Informative Letter to Profession

A letter to be sent to every member of the American Medical Association outlining briefly the contributions the Association and the various councils and departments in the headquarters office are making to the welfare of the individual physician, to his county and state society and to the general health and well being of the American people was approved. Following the letter a copy of the Handbook of the Association will be sent.

Survey of Medical Education

A report was received by the Board of Trustees to the effect that the Kellogg Foundation has approved a grant of $75,000 to assist the Committee for the Survey of Medical Education in the conduct of its survey during the next two years and that a check for $37,500 has been received, representing that portion of the grant which is being made for the calendar year 1950.

Indoctrination Course for Executive Personnel in County and State Societies

A suggestion from the Medical Society Executives Conference that an organized program for training newly designated executive personnel in county and state societies be developed was approved by the Board of Trustees. The arrangements will be made through the Secretary and General Manager for an indoctrination course in the headquarters office.

Multiplicity of Conferences

Because of the multiplicity of conferences and also because most of the state secretaries and editors of state medical journals attend the Public Relations Conference, the Board voted to discontinue the Annual Conference of Secretaries of Constituent State Medical Associations and Editors of State Medical Journals.

Traffic Accident Prevention

A communication from the Automotive Safety Foundation, suggesting ways in which the medical profession can give still greater stimulus and assistance to traffic accident prevention, was referred by the Board to the Secretary and General Manager and the Editor for mention of the matter in the Secretary's Letter and in THE JOURNAL.

Publication of Proceedings of Clinical Presentations

Permission was given to the American Psychiatric Association for publication in book form of the clinical presentations concerned with neurology and psychiatry at the Clinical Session of the Association in Washington in December. The Chairman of the Council on Scientific Assembly, the coordinator and the subchairman have agreed to serve as an editorial committee.

Gift of Film to Scandinavian Medical Association

The Board authorized compliance with the request of the Scandinavian Medical Association for a copy of the Association's film entitled "The Medical Motion Picture—Its Development and Present Application."

AUTOMOTIVE SAFETY FOUNDATION

Jan. 28, 1950.

Dr. George F. Lull, Gen. Manager and Secretary
American Medical Association
535 North Dearborn Street
Chicago, Illinois
Dear Dr. Lull:

Following your suggestion to Norman Damon, Vice President of the Automotive Safety Foundation, in Chicago recently, herewith are our suggestions of ways in which the medical profession could give still greater stimulus and assistance to traffic accident prevention.

Many doctors and some medical associations have expressed their interest in, and views on, various aspects of traffic safety, including vehicle design, particularly in relation to crash injuries. We recognize the major contribution of the medical profession to lessening the loss of life and limb in such accidents and believe much more can be done by a coordination of such efforts through your national headquarters.

To that end, may we suggest that you take whatever steps are appropriate to strengthen your Committee on Motor Vehicle Accidents and make it an effective functioning agency?

Some months ago a number of persons interested in traffic accident prevention met with Dr. Heise, the present chairman of the Committee, and your Mr. Hall, to assist in outlining what seemed to us productive areas of interest.

Points considered were (*a*) the public relation value of medical contributions to traffic accident prevention; and (*b*) the value to individual doctors and hospitals of minimizing the demands upon their time and facilities of accident victims, particularly the indigent.

Possible national, state and local associations, as well as individual doctor's activities included:

(*a*) *Medical Associations*

Cooperative research on accident costs, particularly to doctors, hospitals and the community at large.

At present the United States Bureau of Public Roads is conducting a pilot study of economic costs of motor vehicle accidents.

(*b*) Investigation and emphasis on relation of health to safety. The various public and private health agencies have indicated their readiness to participate in such efforts.

(*c*) Study of the relationships of both mental and physical condition of drivers to the accident problem. For example the state of New Jersey is now re-examining drivers over 65 for cause, though little is known of the relation between age and accident proneness.

Too little is known of the relationship between fatigue, vision and effect of alcohol and drugs as accident inducers. Medical guidance is needed.

(*d*) Need for a better definition of narcotics as now interpreted in motor vehicle law, looking toward better control of narcotic and drug addicts in the use of motor vehicles.

(*e*) Stepping up the American Medical Association's support for the legal recognition of chemical tests for intoxication, whereby duly qualified technicians such as public health officers, police, coroners and others can qualify as technicians testifying in court, thereby freeing doctors from this obligation which they avoid whenever possible.

Possible Aid of Individual Doctors

(*a*) Doctors could materially aid their patients and the safety record by advising those with heart conditions, or under treatment with drugs, or with failing eyesight or other physical or mental shortcomings to "take it easy in driving under heavy traffic conditions."

(*b*) Help might well be given in uncovering epileptic cases, drug addicts and others in cooperation with driver licensing authorities.

(c) A better job could be done in informing patients and the public of the effect of the use of certain medicines or drugs, such as some hay fever remedies which induce drowsiness.

Our organization, and I am sure all others interested in traffic accident prevention, stand ready to cooperate with you in every way possible. Should you and your Board of Trustees feel that the subject merits more attention by your associations and members we will be glad to assist on call in providing you with staff assistance to aid in developing specific activities.

Very truly yours,

PYKE JOHNSON, President.

THE CORPORATE PRACTICE OF MEDICINE

A study made by the Bureau of Legal Medicine and Legislation, at the direction of the House of Delegates, of laws relating to the practice of medicine by corporations is now available in printed form and may be obtained from the Order Department of the Association. The study includes references to pertinent provisions of medical practice acts and to laws under which incorporation may be effected. It also presents brief digests of appellate court decisions and opinions of state attorneys general relating to the corporate practice of medicine or allied groups in the field of the healing art.

Washington Letter

(From a Special Correspondent)

March 18, 1950.

Oak Ridge Cancer Research Center to Open in April

On or about April 1 the Oak Ridge (Tenn.) Cancer Research Center is expected to open. It has thirty clinical beds which will be limited to patients referred by the twenty southern medical schools participating in the project. Patients coming direct to the Oak Ridge unit cannot be accepted, it was emphasized by Dr. Marshall Brucer, chairman of the medical division of the Oak Ridge Institute of Nuclear Studies, which will operate the cancer center for the Atomic Energy Commission.

In the middle of March the House Appropriations Committee made public the testimony on objectives and costs of the center, which was presented to it a few weeks earlier by Dr. Shields Warren, director of the Atomic Energy Commission's division of biology and medicine. He made the following points: The Oak Ridge unit will not be a central hospital for treatment of cancer but rather a center for the exploration of methods for treatment; leukemia in children will be one of the conditions receiving special attention; total budget for operation of the center will be $300,000 to $350,000 annually, and patients will not pay for treatment.

Members of the committee which will pass on admittance of patients, Dr. Warren testified, are Drs. R. Lee Clark Jr., of Houston, Texas; G. T. Harrell, of Winston-Salem, N. C.; R. B. Taft, of Charleston, S. C., and Marshall Brucer.

Many Congressional Hearings Under Way or Scheduled

Representatives of national, state and local professional and voluntary associations, as well as government officials, are to be witnesses at a number of separate hearings to be conducted this spring on Capitol Hill on a variety of subjects. The House Expenditures Committee fixed March 22 for launching hearings on a bill for establishment of a United Medical Administration, along lines recommended last year by the Hoover Commission. It was expected that the inquiry would continue well into April. The American Medical Association and the American Dental Association were among the organizations invited to present views.

The special committee formed by the House to investigate lobbying practices will open public hearings March 27. Civilian defense is the subject of hearings which were scheduled to be launched March 20 by the Joint Congressional Committee on Atomic Energy. A special subcommittee of the House Armed Services Committee was to decide, after its return to Washington March 25 from a two week inspection of military hospitals, whether it will resume the taking of testimony on administration of Army and Navy hospitals, with particular reference to dependents' and veterans' care. On March 16 the Senate Appropriations Committee conducted a one day investigation of federal hospitalization, its members questioning representatives of the Veterans Administration, the Department of Defense, the armed services and the U. S. Public Health Service.

Abatement of Air Pollution Stressed

Plans have been announced for the first government-sponsored conference on air pollution to be held in Washington May 3-5. Health hazards will be one of the major topics, this phase being under the chairmanship of Dr. James G. Townsend, chief of industrial hygiene in the U. S. Public Health Service. Serving as co-chairman is Dr. Robert A. Kehoe, of Kettering Laboratories, Cincinnati.

The Army Chemical Center at Edgewood, Md., recently began lending assistance to Baltimore and adjoining counties which are trying to solve "smog" problems.

$823,340 in U. S. Cancer Grants Awarded

The U. S. Public Health Service has announced award of 22 grants to aid cancer control projects and 33 grants to medical and dental schools to support teaching projects. The aggregate amounts are $301,159 and $522,181, respectively. The control grants will go to medical schools, health departments, hospitals and other institutions in 12 states, Hawaii and Puerto Rico. Recipients of teaching aid are 20 medical and 13 dental schools in 20 states and the District of Columbia.

Cut in Personnel of Veterans Hospitals Protested

Veterans organizations, members of Congress, the American Psychiatric Association and others have protested against the Veterans Administration's order abolishing a total of 7,800 positions in April. Nearly 4,900 of these are in the Department of Medicine and Surgery, of which 3,000 are in hospitals, 1,800 in regional and area offices and the remainder in the Washington central office. Physicians, dentists, nurses and other professional personnel are affected, as well as technicians and clerical employees.

Medical Leaders Appeal for Greater Research Funds

Prominent medical leaders in cancer, heart and mental diseases appeared before the Senate Appropriations Committee March 15 and 16 to urge increased federal funds for research in those fields. Among them were Drs. Paul White, T. Duckett Jones, Douglas Danford Bond, Clifton T. Perkins, George S. Stevenson, Fred Homburger, Ross Veal, Johan Van Ophuijsen, Mortimer Sackler and C. N. Hardin Branch. Witnesses in support also included Gloria Swanson, the film actress, and John Gunther, author.

Admiral Clarence Brown Succeeds Admiral Boone

Rear Admiral Clarence Brown, Navy Medical Corps, has been appointed to the liaison position in the office of medical services, Department of Defense, from which Rear Admiral Joel T. Boone was separated. Admiral Brown formerly was attached to the Bureau of Medicine and Surgery in charge of research activities and as chief inspector of hospitals.

Federal Trade Commission Cites "Sulgly-Minol"

The latest medicinal preparation to elicit an official complaint by the Federal Trade Commission is "Sulgly-Minol," marketed by Walter W. Gramer, of Minneapolis. Challenged as false by the Commission were advertised claims of its efficacy in arthritis and in treatment of acne, boils and "athlete's foot."

Coming Medical Meetings

Alabama, Medical Association of the State of, Birmingham, April 20-22. Dr. Douglas L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
American Academy of Neurology, Cincinnati, Netherlands-Plaza Hotel, April 14-15. Dr. Joe R. Brown, Mayo Clinic, Rochester, Minn., Secretary.
American Association for the Study of Neoplastic Diseases, Washington, D. C., March 30-April 1. Dr. Eugene R. Whitmore, 2139 Wyoming Ave., N.W., Washington, D. C.
American Association for Thoracic Surgery, Denver, Colo., April 15-19. Dr. Brian Blades, 901 Twenty-Third St. N.W., Washington, D. C., Secretary.
American Association of Anatomists, New Orleans, Louisiana State University, April 3-5. Dr. Normand L. Hoerr, 2109 Adelbert Road, Cleveland 6, Secretary.
American Association of Industrial Physicians and Surgeons, Chicago, Hotel Sherman, April 24-28. Dr. Frederick W. Slobe, 28 E. Jackson Blvd., Chicago 4, Secretary.
American Association of Pathologists and Bacteriologists, Madison, Wis., April 14-15. Dr. Alan R. Moritz, 2085 Adelbert Road, Cleveland 6, Secretary.
American Association of Railway Surgeons, Chicago, Drake Hotel, April 4-6. Dr. Chester C. Guy, 5800 Stony Island Ave., Chicago 37, Secretary.
American Association on Mental Deficiency, Columbus, Ohio, Hotel Deshler-Wallick, May 16-20. Dr. Neil A. Dayton, P. O. Box 96, Willimantic, Conn., Secretary.
American College of Physicians, Boston, April 17-21. Dr. George Morris Piersol, 4200 Pine St., Philadelphia, Secretary General.
American Congress on Obstetrics and Gynecology, New York, Hotel Pennsylvania, May 14-19. Dr. F. Bayard Carter, Duke Medical School, Durham, N. C., Secretary.
American Gastro-Enterological Association, Atlantic City, April 28-29. Dr. Dwight L. Wilbur, 655 Sutter St., San Francisco, Secretary.
American Gynecological Society, White Sulphur Springs, W. Va., The Greenbrier, May 11-13. Dr. Norman F. Miller, 1313 E. Ann St., Ann Arbor, Mich., Secretary.
American Pediatric Society, French Lick, Ind., May 8-10. Dr. Henry G. Poncher, 1819 W. Polk St., Chicago 12, Secretary.
American Physiological Society, Atlantic City, April 17-21. Dr. Milton O. Lee, 2101 Constitution Ave., Washington 25, D. C., Executive Secretary.
American Psychiatric Association, Detroit, May 1-5. Dr. Leo H. Bartemeier, General Motors Bldg., Detroit 2, Secretary.
American Psychosomatic Society, Atlantic City, Chalfonte-Haddon Hall, April 29. Dr. Sydney G. Margolin, 714 Madison Ave., New York 21, Secretary.
American Society for Clinical Investigation, Atlantic City, May 1. Dr. Paul B. Beeson, Grady Hospital, Atlanta 3, Ga., Secretary.
American Society for Experimental Pathology, Atlantic City, April 11. Dr. Sidney C. Madden, Brookhaven National Laboratory, Upton, L. I., New York, Secretary.
American Society for Pharmacology and Experimental Therapeutics, Atlantic City, April 17-21. Dr. Harvey B. Haag, Medical College of Virginia, Richmond 19, Secretary.
American Society of Biological Chemists, Atlantic City, April 9-14. Dr. R. W. Jackson, 825 N. University St., Peoria 5, Ill., Secretary.
American Surgical Association, Colorado Springs, Colo., April 19-23. Dr. Nathan Womack, University Hospitals, Iowa City, Iowa, Secretary.
American Therapeutic Society, Boston, April 13-16. Dr. Oscar B. Hunter, 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.
Arizona State Medical Association, Phoenix, Hotel Westward Ho, April 30-May 4. Dr. Frank J. Milloy, 234 N. Central Ave., Phoenix, Secretary.
Arkansas Medical Society, Fort Smith, April 17-19. Dr. William R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.
Association of American Physicians, Atlantic City, May 2-3. Dr. Henry M. Thomas Jr., 1201 N. Calvert St., Baltimore 2, Secretary.
California Medical Association, San Diego, April 30-May 3. Dr. L. Henry Garland, 450 Sutter St., San Francisco, Secretary.
Connecticut State Medical Society, Waterbury, May 2-4. Dr. Creighton Barker, 160 St. Ronan St., New Haven, Secretary.
Federation of American Societies for Experimental Biology, Atlantic City, April 17-21. Dr. Milton O. Lee, 2101 Constitution Ave., Washington 25, D. C., Secretary.
Florida Medical Association, Hollywood, April 23-26. Dr. Robert B. McIver, P. O. Box 1018, Jacksonville, Secretary.
Georgia, Medical Association of, Macon, Hotel Dempsey, April 18-21. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
Hawaii Territorial Medical Association, Hilo, May 4-7. Dr. I. L. Tilden, Mabel Smyth Bldg., Honolulu 13, Secretary.
International and Fourth American Congress on Obstetrics and Gynecology, New York, Hotel Pennsylvania, May 14-19. Dr. Fred L. Adair, 161 E. Erie St., Chicago 11, Information Headquarters.
Iowa State Medical Society, Burlington, April 23-26. Dr. Allan B. Phillips, 406 Sixth Ave., Des Moines 9, Secretary.
Kansas Medical Society, Wichita, May 15-18. Dr. D. D. Vermillion, 512 New England Bldg., Topeka, Secretary.
Louisiana State Medical Society, Baton Rouge, April 24-26. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans 13, Secretary.
Maryland, Medical and Chirurgical Faculty of the State of, Baltimore, April 25-26. Dr. George H. Yeager, 1211 Cathedral St., Baltimore 1, Secretary.
Massachusetts Medical Society, Boston, Hotel Statler, May 16-19. Dr. H. Quimby Gallupe, 8 Fenway, Boston 15, Secretary.
Mississippi State Medical Association, Jackson, May 9-11. Dr. T. M. Dye, Box 295, Clarksdale, Secretary.
Missouri State Medical Association, St. Louis, March 26-29. Dr. H. E. Petersen, 634 N. Grand Blvd., St. Louis 3, Secretary.
National Society for the Prevention of Blindness, Miami, Fla., Hotel Floridian, March 26-30. Dr. Franklin M. Foote, 1790 Broadway, New York 19, Executive Director.
National Tuberculosis Association, Washington, D. C., April 25-28. Dr. James E. Perkins, 1790 Broadway, New York 19, Managing Director.
Nebraska State Medical Association, Lincoln, Hotel Cornhusker, May 1-4. Dr. R. B. Adams, 1315 Sharp Bldg., Lincoln, Secretary.
New Mexico Medical Society, Las Cruces, May 4-7. Dr. H. L. January, 4852 Southern Ave., Albuquerque, Secretary.
New York, Medical Society of the State of, New York, May 8-12. Dr. Walter P. Anderton, 292 Madison Ave., New York 17, Secretary.
North Carolina, Medical Society of the State of, Pinehurst, The Carolina, May 1-3. Dr. Millard D. Hill, 15 W. Hargett St., Raleigh, Secretary.
Northern Tri-State Medical Association, Grand Rapids, Mich., April 11. Dr. William H. Gordon, 1553 Woodward Ave., Detroit, Secretary.
Ohio State Medical Association, Cleveland, May 16-19. Mr. Charles S. Nelson, 79 E. State St., Columbus 15, Executive Secretary.
Oklahoma State Medical Association, Oklahoma City, May 14-17. Dr. Lewis J. Moorman, 210 Plaza Court, Oklahoma City, Secretary.
Rhode Island Medical Society, Providence, R. I. Medical Library, May 10-11. Dr. Morgan Cutts, 106 E. Francis St., Providence 3, Secretary.
Society of American Bacteriologists, Baltimore, May 15-19. Dr. John E. Blair, 1919 Madison Ave., New York 35, Secretary.
South Carolina Medical Association, Myrtle Beach, May 16-18. Dr. Julian P. Price, 105 W. Cheves St., Florence, Secretary.
Tennessee State Medical Association, Memphis, April 10-12. Dr. W. M. Hardy, 706 Church St., Nashville 3, Secretary.
Texas, State Medical Association of, Fort Worth, May 2-5. Dr. Harold M. Williams, 700 Guadalupe St., Austin, Secretary.

Medical Legislation

STATE LEGISLATION

Georgia

Bill Enacted.—S. 126 has become Governor's Act 749 of the Acts of 1950. It provides regulations for the chartering of nonprofit corporations organized for the purpose of establishing, maintaining and operating **nonprofit hospital service plans.**

Idaho

Bill Enacted.—H. 42-X was approved March 7, 1950. It amends the law relating to the establishment of a **state board of eugenics** by requiring that such board shall be composed of five persons who are qualified in medicine and/or psychiatry and who shall be appointed by the governor with the advice and consent of the senate. Operations performed on persons by the consent of the person involved must be performed by or under the direction of a surgeon specially designated for each case by the board.

Massachusetts

Bill Introduced.—H. 2265, App. B, proposes the creation of a committee to make an investigation and study relative to **high blood pressure.**

Mississippi

Bill Introduced.—S. 549 proposes to permit **dead bodies of hospital patients** to be turned over, in certain circumstances, to medical schools or to teaching hospitals.

New York

Bills Introduced.—A. 2651 proposes the enactment of a **health insurance law.** A. 2802, to amend the mental hygiene law, proposes to require **psychiatric clinics** to be licensed and defines a psychiatric clinic as a mental hygiene clinic, child guidance clinic and any other facility, by whatsoever name known, established or maintained by a public body, board, commission, official or a membership corporation for the examination, diagnosis, care or treatment, on an outpatient basis, of persons suffering from mental illness, mental defect, epilepsy or behavior or emotional disorders. A. 2890 proposes that if neither the medical examiner nor his assistant in Dutchess County is a pathologist, then the board of supervisors shall appoint **an assistant county medical examiner** whose only qualification for office and duties shall be that of pathologist. A. 2941 and S. 2588, to amend the education law, proposes regulations for the **licensing of naturopaths.** The proposal would require that one member of the state board of medical examiners be a naturopath, declares the practice of naturopathy to be the practice of medicine and proposes that a license to practice naturopathy shall not permit the holder thereof to administer internal toxic drugs or perform major surgery.

South Dakota

Bill Introduced.—S. 8-X, to amend the basic science act, proposes that its provisions shall not apply to graduates of **approved medical or osteopathic or chiropractic schools** if they graduated prior to March 15, 1939 and have been active in the practice since graduation.

Virginia

Bills Enacted.—S. 101 has become chapter 97 of the Laws of 1950. It requires every **physician attending a pregnant woman** during gestation to take or cause to be taken a sample of blood of such woman within 15 days of the first examination and to submit such sample to a state department of health laboratory or a laboratory approved by the department for a serologic test for syphilis. S. 115 has become chapter 88 of the Laws of 1950. It amends the medical practice act by providing regulations to **reciprocity** between Virginia and the District of Columbia. S. 181 has become chapter 99 of the Laws of 1950. It provides regulations for **the licensing of chiropodists by** the board of medical examiners and amends the practice of osteopathy by requiring applicants therefor to take further examinations before the board to indicate that he is qualified to administer drugs, in which case he may be permitted to use drugs.

Wyoming

Bill Enacted.—S. 2-X has become chapter 12 of the Laws of 1950. It authorizes the trustees of the University of Wyoming to contract with medical schools outside of the state for the purpose of training residents of the state in medicine, dentistry, veterinary or nursing.

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GOVERNMENT SERVICES

NAVY

SHIPS DOCTORS WANTED

The Military Sea Transportation Service, Atlantic, is accepting applications for civilian positions of ships doctors aboard Navy transports. These transports are vessels operated by the Navy for the International Refugee Organization in connection with the resettlement of displaced persons from Europe to various countries throughout the world. Doctors who are accepted for such employment join their ships at New York and sail for Europe and thence to various ports throughout the world. Voyages generally are of 90 day duration, with vessels returning to New York. The salary is $6,350 per annum plus maintenance. Applicants may apply for one or more voyages and are not bound to serve beyond one voyage.

Applicants are required to possess a current license to practice medicine or surgery issued under the authority of a state or territory of the United States or the District of Columbia. They must have been graduated from an approved school of medicine and must have completed at least one year of internship. Candidates must be United States citizens, and available on short notice, and may be from 25 to 62 years of age. Information may be obtained from the Executive Secretary, Civilian Marine Board of Examiners, Military Sea Transportation Service, Atlantic, 58th Street and First Avenue, Brooklyn 20.

DUTY UNDER INSTRUCTION

The following medical officers have been nominated for duty under instruction in the Navy's Graduate Medical Training Program:

Lieut. Comdr. William W. Henderson, to a residency in surgery, Naval Hospital, Portsmouth, Va.

Lieut. Comdr. Wayne W. Waters, to a residency in general surgery, Naval Hospital, Portsmouth, Va.

Lieut. (jg) Wallace C. Ellerbrock, to a residency in general surgery, Naval Hospital, St. Albans, L. I., New York.

Lieut. (jg) Edwin S. Gomsi, to a residency in obstetrics and gynecology, Naval Hospital, Great Lakes, Ill.

Lieut. (jg) Robert L. King Jr., to a residency in otolaryngology, Naval Hospital, San Diego, Calif.

Lieut. (jg) Harold M. Peacock, to a residency in surgery, Naval Hospital, Great Lakes, Ill.

Lieut. (jg) William R. Raulston, to a residency in obstetrics and gynecology, Naval Hospital, Great Lakes, Ill.

Lieut. (jg) Wayne "L" Wright Jr., to a residency in dermatology and syphilology, Naval Hospital, St. Albans, L. I., New York.

Comdr. George Donabedian, to instruction in the Senior Course, Amphibious Warfare School, MarCorSchool, Quantico, Va.

Lieut. (jg) Donald W. Grimes, to a residency in internal medicine, Naval Hospital, Oakland, Calif.

Lieut. (jg) Charles E. Bancroft, to a residency in obstetrics and gynecology, Naval Hospital, Oakland, Calif.

Lieut. (jg) Samuel Fox III, to a residency in internal medicine, Pennsylvania Hospital, Philadelphia.

ACTIVE DUTY

The following reserve medical officers have been nominated for active duty at their own request:

Lieut. Robert H. Morrison, Petersburg, Va.
Lieut. (jg) Thomas J. Anderson, Greensboro, Ala.
Lieut. (jg) Charles F. Barlow, Clear Lake, Iowa.
Lieut. (jg) Edward G. Bauer, St. Paul.
Lieut. (jg) Richard P. Levy, Woodmere, N. Y.
Lieut. (jg) Wesley R. Lochausen, Sanderson, Texas.
Lieut. (jg) Homer C. Wick Jr., Washington, D. C.

PERSONAL

Capt. Frederick C. Greaves (MC), who was recently made a rear admiral, has reported to the Bureau of Medicine and Surgery for duty as assistant chief of the Bureau for Research and Medical Military Specialties.

Capt. Robert M. Gillett (MC) has assumed command of the Naval Hospital, Bethesda, Md. During World War II he participated in five major operations in the Pacific and was awarded the Legion of Merit with combat device.

The Secretary of the Navy has selected Comdr. Winnie Gibson to be director of the Navy Nurse Corps, succeeding Capt. Nellie J. DeWitte (NC), who is scheduled for retirement May 1, 1950. On assuming her new duties, Commander Gibson will attain the rank of captain.

Reserve Lieutenants Robert H. Morrison, Donald W. Robinson and Konstantin H. Geocaris have transferred to the regular Navy and are under instruction in obstetrics and gynecology, Garfield Memorial Hospital, Washington, D. C.; residency in surgery, Naval Hospital, Great Lakes, Ill., and residency in internal medicine, Naval Hospital, Oakland, Calif., respectively.

Comdr. Thomas C. Ryan (MC) was recently certified by the American Board of Surgery.

Capt. Thomas F. Cooper (MC) has been assigned to command the U. S. Naval Hospital, Great Lakes, Ill., relieving Capt. John Q. Owsley, who was approved recently for promotion to the rank of rear admiral.

Capt. Emmett D. Hightower (MC) has been assigned to Great Lakes, Ill., as executive officer of the U. S. Naval Hospital, relieving Capt. D. W. Lyon (MC), who has been ordered to command the hospital at U. S. Naval Air Station, Pensacola, Fla.

Lieut. (jg) Tom Connolly Burditt (MC, USNR) of Abilene, Texas, has been nominated for first active duty and is being assigned to the Naval Hospital, Bremerton, Wash.

AIR FORCE

CONFERENCE ON AVIATION SAFETY

A conference on human factors in aircraft accidents will be held at the Pentagon, Washington, D. C., April 7 to present the needs for a continuing survey. Research in human factors contributing to airplane accidents has been in progress for many years. However, owing to the rapid development of new type, high speed aircraft, it is necessary to examine new fields of research to keep abreast of the human requirements in flying safety.

Representatives have been invited to attend from the Civil Aeronautics Board, the Civil Aeronautics Administration, the National Safety Council, the Highway Research Board, the Air Transport Association of America and the Crash Injury Research Group of Cornell University. Besides the Office of the Surgeon General, seven other offices within the Air Force will make presentations. They are: Assistant for Ground Safety; Director of Flying Safety, Office of Inspector General; Director of Plans and Operations; Director of Requirements; Director of Training; Human Resources Division, Director of Research and Development, and Human Resources Research Laboratories.

Medical News

(Physicians will confer a favor by sending for this department items of news of general interest: such as relate to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.)

CALIFORNIA

Popular Medical Lectures.—Stanford University School of Medicine, San Francisco, is presenting illustrated medical lectures to which the public is invited on Wednesday evenings at 8 o'clock beginning March 29. The program is as follows:

March 29, H. Corwin Hinshaw, San Francisco, New Drugs in Tuberculosis.
April 5, Francis L. Chamberlain, San Francisco, Present Day Treatment of High Blood Pressure.
April 19, Rodney R. Beard, San Francisco, The Common Cold.
April 26, William C. Kuzell, San Francisco, ACTH, the Magic Hormone.

Chest Minifilm Service.—Eight months of operation of the Physician's Chest Photofluorographic Service as a demonstration program ended December 23 with a total of 11,582 free chest minifilms made for patients of 1,290 Los Angeles County Medical Association members. Some 1,028 of the patients were referred to their physicians for further study, the films having shown 410 as suspicious for tuberculosis, 361 as having possible cardiac abnormalities and 294 for other chest pathology. The demonstration was sponsored by the Los Angeles County Tuberculosis and Health Association with the approval of the Los Angeles County Medical Association. Only those patients for whom a minifilm would not ordinarily have been made were sent to the service.

DELAWARE

Refresher Courses.—The Delaware Academy of Medicine, Wilmington, is sponsoring the following all day refresher courses:

Poliomyelitis, March 28, 10 a. m., A. I. du Pont Institute, Wilmington.
Rheumatic Fever, April 6, 10 a. m., Delaware Academy of Medicine.
Diabetes, May 16, 10 a. m., Veteran's Administration Hospital, Elsmere.

FLORIDA

State Medical Meeting at Hollywood.—The Florida Medical Association will hold its annual meeting at the Hollywood Beach Hotel, Hollywood, April 23-26, under the presidency of Dr. Walter C. Payne, Pensacola. Out-of-state physicians on the program include:

J. Peerman Nesselrod, Evanston, Ill., Proctoscopic Color Movies.
Emil Novak, Baltimore, Treatment of Pelvic Malignant Disease.
Meredith Campbell, New York, Chronic Pyuria in Children.
Alton Ochsner, New Orleans, Prevention of Venous Thrombosis Based on New Concepts of Blood Coagulation.
Col. W. L. Wilson, Washington, D. C., Medical Planning for Atomic Disaster.

The annual dinner is scheduled for Tuesday night. Scientific and technical exhibits will be shown. The Woman's Auxiliary will convene in conjunction with the meeting of the association. Eighteen specialty groups will hold sessions the week end preceding the opening of the state meeting.

GEORGIA

Report of Warm Springs Foundation.—The Georgia Warm Springs Foundation in its annual report for the year ending Sept. 30, 1949 states that 889 patients received 58,446 hospital days' care. Patients came from 40 states, the District of Columbia, Hawaii, Puerto Rico and 19 foreign countries. Financial assistance was given to 629, who received 82 per cent of the total hospital days' care. The average daily number of patients in residence was 160. Foundation expenses exceeded revenue for the year by $155,911. However, with grants from the National Foundation for Infantile Paralysis, it was able to increase the general fund reserve for the year by $85,331.24.

ILLINOIS

Postgraduate Conferences.—A postgraduate conference will be held for the First Councilor District at the Leland Hotel in Aurora March 29 with the Kane County Medical Society acting as host. The program, which begins at 2 p. m., will present the following speakers:

Max S. Sadove, Chicago, Modern Anesthesiology.
Max M. Montgomery, Chicago, Current Therapy of Rheumatoid Arthritis.
Beulah C. Bosselman, Chicago, Role of Psychiatry in Modern Medicine.
Frederick H. Falls, Chicago, Breech Presentation.

A round table will take place at 5 p. m. The dinner speaker will be Dr. Philip Thorek of Chicago, whose subject will be "The Acute Abdomen." The First Councilor District includes the counties of Boone, Carroll, DeKalb, Jo Daviess, Kane, Lake, McHenry, Ogle, Stephenson and Winnebago.——A postgraduate conference will be held for the Tenth Councilor District in Belleville, April 6 at the St. Clair County Club, with the St. Clair County Medical Society acting as host. The speakers will be:

Thomas H. Hunter, St. Louis, New Antibiotics.
Edmund A. Smolik, St. Louis, Management of Cerebral Accidents.
Walter J. Siebert, St. Louis, Papanicolaou Smears in Early Diagnosis of Cancer.
Sidney A. Portis, Chicago, Approach to the Handling of Psychosomatic Problems.
Philip Thorek, Chicago, Acute Abdomen.
Norris J. Heckel, Chicago, Hematuria.

A round table will conclude the afternoon's session. At the dinner in the evening Dr. Walter Stevenson, Quincy, president of the Illinois State Medical Society, will discuss "Doctors and Their Political Obligations." The Tenth Councilor District embraces the counties of St. Clair, Monroe, Washington, Randolph, Perry, Jackson, Union, Alexander and Pulaski. The conferences have been arranged by the Postgraduate Education Committee of the Illinois State Medical Society.

Chicago

Society News.—The North Side Branch of the Chicago Medical Society will meet April 6 at the Drake Hotel at 8 p. m. Dr. William B. Bean, Iowa City, will speak on "Differential Diagnosis of Pain in the Chest" and Dr. Frank E. Whitacre, Memphis, Tenn., "Diagnosis and Treatment of Bleeding During Pregnancy."

Nutrition Association Meeting.—The Chicago Nutrition Association is sponsoring a meeting for professional persons April 6 in the Casino Room of the Congress Hotel at 6 p. m. Dr. Carl V. Moore, professor of medicine at Washington University School of Medicine, St. Louis, will speak on "Isotopes in Iron Metabolism." Reservations for the dinner should be sent to Mrs. Marie Hosfield, Chicago Nutrition Association, 848 North Dearborn, Chicago 10, before March 30.

The Seventh Billings Lecture.—Dr. Hans Selye, director of the Institute of Experimental Medicine and Surgery at the University of Montreal Faculty of Medicine, Canada, will deliver the seventh Frank Billings Lecture of the Institute of Medicine of Chicago at a joint meeting with the Chicago Medical Society April 7, in the John B. Murphy Memorial Auditorium. His subject will be "The Diseases of Adaptation; with Special Reference to the Clinical Use of Corticoid Hormones."

INDIANA

Course in Otolaryngology.—A practical course in surgical and clinical anatomic features of otolaryngology will be given April 3-15 by the Indiana University School of Medicine at Indianapolis. Inquiries shall be addressed to Dr. Carl H. McCaskey, chairman, Department of Otolaryngology, 608 Guaranty Building, Indianapolis 4.

State Board of Health New Building.—The Indiana State Board of Health moved into its four story $2,000,000 headquarters building in Indianapolis March 13. The vacated quarters will be taken over by clinical laboratories from the Robert W. Long Hospital and cancer and surgical research units from the Indiana University Medical School.

IOWA

Centennial Meeting of State Society.—The Iowa State Medical Society will hold its centennial meeting in Burlington, April 23-26, at the Memorial Auditorium under the presidency of Dr. Nathaniel G. Alcock, Iowa City. Guest speakers include:

Robert L. Sanders, Memphis, Tenn., Gallbladder and Common Duct Problem.
Wendell G. Scott, St. Louis, Significance of Rectal Bleeding and Importance of Diagnosing Early Cancer of the Colon.
Albert D. Ruedemann, Detroit, Headaches and Head Pains of Ocular Origin.
Stevens J. Martin, Hartford, Conn., The Present Day Anesthesiologist.
Reed M. Nesbit, Ann Arbor, Mich., Clinical Management of Infertility.
James A. Greene, Houston, Texas, Use and Abuse of Thyroid Therapy.
J. Harvey Black, Dallas, Texas, Allergic Conditions Seen in General Practice.
Fremont A. Chandler, Chicago, Fractures of Distal End of Radius.
Samuel A. Cosgrove, Jersey City, N. J., Red Lights in Obstetrics.
Reynold A. Jensen, Minneapolis, Importance of Emotional Tensions in Children's Medical Problems.
Marjorie Shearon, Ph.D., Washington, The Road of No Return.
Mr. Leonard E. Read, New York, Try to Be That Person Yourself.
William E. Adams, Chicago, Advances in Thoracic Surgery with Special Reference to Indications for Pulmonary Resection.
Willard M. Allen, St. Louis, Gynecologic Endocrinology in General Practice.

Monday afternoon a panel discussion on the Doctor and the Law will be presented by Dr. Alan R. Moritz, Cleveland, Mr. H. R. Duncan, L.L.B., Des Moines, and Dr. Ernest M. Hammes,

St. Paul. Section meetings will be held in medicine, eye, ear, nose and throat; surgery; obstetrics; orthopedics, and pediatrics. The annual banquet will be held Tuesday at 7 p. m. The Woman's Auxiliary will meet April 24-25. A golf tournament will be held on Sunday.

MICHIGAN

Cerebral Palsy Clinics.—Dr. Meyer A. Perlstein, Chicago, will conduct cerebral palsy clinics in Bay City April 10-11, in Flint on April 12-13, in Jackson on May 1-2, in Lansing May 3-4 and in Battle Creek on May 16 and 17.

Industrial Health Day.—A number of state societies and universities are sponsoring an industrial health day March 29 in the School of Public Health of the University of Michigan, Ann Arbor. The morning session, under the chairmanship of Dr. Max. R. Burnell, Flint, will comprise a panel discussion by nine physicians of Detroit and Ann Arbor on "Medical Problems of the Older Age Group in Industry." Seven physicians under the chairmanship of Dr. Joseph L. Zemens, Detroit, will participate in a panel discussion at 2 p. m. on "Ambulatory Surgery in Industry." At the evening session the guest of honor will be Dr. Alfred H. Whittaker, president of the American Association of Industrial Physicians and Surgeons, and guest speaker will be Dr. John A. Schindler, Monroe, Wis. Topic for the evening session is "Old Age—An American Problem." The annual business meeting of the Michigan Association of Industrial Physicians and Surgeons will be held at 4:30. Sponsors of the Industrial Health Day are, besides the association, the Michigan State Medical Society, Medical School and the School of Public Health of the University of Michigan, Wayne University College of Medicine and Michigan Health Department Division of Industrial Health.

MINNESOTA

Fraternity Lecture.—Dr. Burrill B. Crohn of Mt. Sinai Hospital, New York, will deliver the annual Phi Delta Epsilon Lecture at the Museum of Natural History, University of Minnesota, Minneapolis, at 8 p. m., April 20, on "Regional Ileitis."

Bell Tuberculosis Lecture.—Dr. Robert G. Bloch, professor of medicine at the University of Chicago School of Medicine, will deliver the annual John W. Bell Tuberculosis Lecture of the Hennepin County Medical Society and the County Tuberculosis Association, April 3. The subject will be "Relationship of Sarcoidosis to Tuberculosis." The annual lectureship was established in 1934 as a tribute to Dr. Bell, former president of the state and county medical associations, the Minnesota Academy of Medicine and the original Hennepin County Sanatorium Commission.

MISSOURI

New State Health Director.—Dr. Buford G. Hamilton, Richmond, has been appointed the Missouri State Health director to replace the late Dr. C. F. Adams. Dr. Hamilton, recently retired, was associate clinical professor of obstetrics and gynecology at the University of Kansas School of Medicine, Lawrence-Kansas City. Since his graduation from Washington University School of Medicine, St. Louis, in 1905, he had practiced in Kansas City.

University Appointment.—Dr. Thomas Thale, medical director at Malcolm A. Bliss Psychopathic Institute in St. Louis, has been appointed to the faculty of the Saint Louis University School of Medicine. He will be in charge of integrating the university's program in neuropsychiatry and will also devote time to the development of clinical services and clinical teaching in neuropsychiatry in the university's Firmin Desloge Hospital. He is a graduate of the Loyola University School of Medicine in Chicago (1940) and a specialist certified by the American Board of Psychiatry and Neurology. Dr. Thale will be executive secretary of a four man committee directing the university's program in neuropsychiatry. The other members of the committee are Dr. Frank M. Grogan, Dr. Robert E. Britt and Dr. Louis H. Kohler.

NEBRASKA

Health Councils.—The planning committee of the Nebraska State Medical Association is in the process of establishing health councils throughout the state. The purposes of these councils will be to cooperate with local public health departments and other interested groups in controlling factors which contribute to disease, to educate laymen on the need for improvements in sanitation, to assist in advancing legislation which pertains to the betterment of public health and to promote participation in voluntary health care plans. The local councils will be made up of persons representing the allied professions, clergymen, teachers, bankers, farmers and others interested in public health; a physician will be the chairman. These councils will have the advice and support of the State Health Council, and their work will be correlated with the activities of the committees on rural health, public relations, public health and other committees of the Nebraska State Medical Association having similar purposes.

NEW YORK

Postgraduate Instruction.—The following postgraduate lectures have been arranged by the Medical Society of the State of New York in cooperation with the New York State Department of Health. Dr. Otto A. Faust, Albany, will address the Warren County Medical Society March 30 at 9 p.m. on "Psychosomatic Pediatrics and the Family Physician" at Queensbury Hotel, Glens Falls. The Onondaga County Medical Society, meeting April 4 at the University Club in Syracuse at 8:30 p.m., will hear Dr. Harold G. Wolff, New York, speak on "Headache Mechanisms." On April 20 Dr. Florence Brent, Brooklyn, will speak on "Toxemias of Pregnancy" before the Clinton County Medical Society meeting in Champlain Valley Hospital Nurses Home in Plattsburg at 8:15 p.m.

Industrial Health Lectures.—A series of postgraduate lectures in industrial health are being presented to the Medical Society, County of Sullivan, on Wednesdays at 8:30 p. m. by the Medical Society of the State of New York with the cooperation of the New York State Department of Health. Remaining lectures on the program, which began March 8, are as follows:

March 29, Monticello (N. Y.) Hospital, George N. Edson, New York, Medicolegal Aspects of Trauma.
April 5, Lenape Hotel, Liberty, Jesse Tolmach, New York, Evaluation of Disability.
April 12, Monticello Hospital, James H. Sterner, Rochester, Systemic Effects of Various Substances Commonly Used in Industry.
April 19, Lenape Hotel, Henry R. Corwin, New York, Industrial Dermatoses.
April 26, Monticello Hospital, Herbert S. Weichsel, New York, Trauma and Peripheral Vascular Disease.
May 17, Sullivan County Golf and Country Club, Liberty, Leon E. Sutton, Syracuse, Reconstruction Following Industrial Injuries.

New York City

Drive to Reduce Infant Mortality.—A special meeting will be held at the Kings County Medical Society Building on April 17 under the auspices of the Child Health and Welfare Committee to launch a campaign for the reduction of premature mortality in Brooklyn. A pilot study of this problem has just been completed under the auspices of the committee and the Maternity and Newborn Division of the New York City Health Department, and the findings will be presented that night. Dr. Julius H. Hess of Chicago and Dr. Leona Baumgartner, associate chief of the Children's Bureau, Washington, D. C., will discuss the results of the investigation. The report was prepared by Drs. Helen M. Wallace and Hilda R. Knobloch of the health department, and Dr. Henry Rascoff, chairman of the Child Health and Welfare Committee of the Medical Society of the County of Kings.

Open Multiple Sclerosis Clinic.—A research clinic to investigate multiple sclerosis and related disorders was opened March 13 with headquarters in Bellevue Hospital. The new clinic was made possible by a grant of over $100,000 from the National Multiple Sclerosis Society to New York University Post-Graduate Medical School and will be staffed by members of the school's faculty. The Bellevue clinic will be the headquarters for studies, which will be carried out in Bellevue, University and Goldwater Memorial hospitals. Current forms of drug therapy will be administered and evaluated. Physical therapeutic studies will be carried out in conjunction with the department of physical medicine and rehabilitation. The clinic will establish a Multiple Sclerosis Study Panel, which will consist of representatives of leading medical centers in this area. Representatives of the New York University-Bellevue Medical Center, the Montefiore Multiple Sclerosis Research Clinic and other medical institutions will participate in the study panel. The clinic will be under the administration of Dr. S. Bernard Wortis, professor of psychiatry, Post-Graduate Medical School, and director of psychiatry and neurology services, University Hospital. Dr. Morris B. Bender, Fourth Division, Bellevue Hospital, will supervise the activities of the clinic. Dr. Morton Nathanson, New York, has been appointed medical director. The clinic is open every Tuesday and Thursday from 1 to 5 p.m. and will soon function on a daily basis. It will be available for selected patients in the Metropolitan New York area without regard to race, color or creed. Selected bed patients will be admitted for diagnostic purposes and special investigations. Information may be obtained from the Multiple Sclerosis Research Office, New York University-Bellevue Medical Center, 477 First Avenue, New York City.

PENNSYLVANIA

Honor Veteran Practitioners.—The Medical Society of the State of Pennsylvania on March 29 will honor 17 local physicians who have been in practice for 50 years at a dinner meeting of the Philadelphia County Medical Society. Dr. E. Roger Samuel, Mt. Carmel, president of the society, will present special certificates. Guest speaker will be Prof. Richard C. Reager, Rutgers University, New Brunswick, N. J., who will speak on "How to Tell Our Story."

Pittsburgh

Course in Gastroenterology.—The University of Pittsburgh School of Medicine will present a postgraduate course in gastroenterology April 3-6. Subjects of succeeding days' lectures are the stomach and duodenum; intestines; liver, biliary tract and pancreas, and the esophagus. Applications should be made to the chairman of the department of medicine, School of Medicine, University of Pittsburgh, Pittsburgh 13. Tuition is $35 payable on the opening morning.

WASHINGTON

General Practice Clinic Day.—The Washington State Chapter of the Academy of General Practice will attend a general practice clinic day program March 31 at the University of Washington Medical School auditorium. Fifteen to twenty minute lectures will be given by members of the university staff.

WEST VIRGINIA

Joint Meeting at the Greenbrier.—A scientific program has been arranged for an interstate medical meeting at the Greenbrier Hotel, White Sulphur Springs, March 29, sponsored jointly by the Alleghany-Bath Medical Society (Virginia) and the Greenbrier Valley Medical Society. Dr. Chester S. Keefer of Boston is scheduled to open the program at 2 p. m. with a paper on "Developments in Antibiotic Therapy." The other speakers on the afternoon program are as follows:

Russell L. Cecil, New York, "Diagnosis and Treatment of Arthritis, with Particular Reference to Cortisone and Pituitary Adrenocorticotropic Hormone (ACTH)."
Frederick A. Coller, Ann Arbor, Mich., "Use and Abuse of Parenteral Fluids in Surgical Patients."
Henry M. Thomas Jr., Baltimore, "The Nervous Patient."

The evening program beginning at 8 o'clock will include the following addresses:

Marion A. Blankenhorn, Cincinnati, "Specificity of the Vitamins and Their Proper Clinical Use."
Harvey B. Stone, Baltimore, "Nonmalignant Surgical Conditions of the Large Bowel."

There will be no registration fee.

GENERAL

Cancer Control Month.—The American Cancer Society during April will conduct its annual campaign to raise funds for research, education and service. During the last five years the society has spent $13,153,500 in its research program alone. The quota for the year is $14,565,000. Half the national office budget this year is for education.

American Medical Golfing Association.—Dr. Charles E. Shannon, Chicago, president of the American Medical Golfing Association, announces that the thirty-fourth tournament will be held at Olympic Club, San Francisco, on June 26. Dr. Edward Campion of 1018 E Street, San Rafael, Calif., is chairman of the 1950 California Committee on Arrangements. Applications for AMGA membership may be obtained by writing William J. Burns, secretary, 2020 Olds Tower, Lansing 8, Mich.

Lasker Award in Human Fertility.—Carl G. Hartman, Ph.D., director of physiology and pharmacology, Ortho Research Foundation, Raritan, N. J., was presented the 1949 Lasker Award by the Planned Parenthood Federation of America, Inc. This award was presented in appreciation of Dr. Hartman's investigation of basic problems of human reproduction and of fertility and importance of other primates in research. The award is made possible by the Albert and Mary Lasker Foundation. Before joining the Ortho Research Foundation in 1947, Dr. Hartman had been professor of zoology and head of the departments of zoology and physiology at the University of Illinois since 1941. He received the Squibb Award from the American Society for the Study of Internal Secretions in 1946.

Physicians Art Association.—The American Physicians Art Association will hold its annual exhibit in San Francisco Auditorium June 26-30 in conjunction with the American Medical Association Convention. Entry blanks may be mailed any time between now and June 5. Art pieces should arrive in San Francisco between June 5 and June 17 at 428 Flood Building, San Francisco 2. Since Mead Johnson and Company, who had formerly taken full charge of the art show, has withdrawn its full sponsorship, the association is asking each exhibitor to defray his own express charges. Size limitation of art work is 50 inches long before framing. Photographs must be 16 by 20 inches mounted. Information may be obtained from Dr. F. H. Redewill, secretary, at the foregoing San Francisco address.

Medical Film Awarded First Prize.—The first in a series of six medical teaching films on cancer, produced under the joint sponsorship of the American Cancer Society and the National Cancer Institute of the U. S. Public Health Service, was recently awarded a first prize in the division of films on medicine and science at the Tenth International Exhibit of Cinematographic Art held in Venice, Italy. In less than a year 200 prints of this film, "Cancer: The Problem of Early Diagnosis," have been purchased by medical schools, hospitals, state health departments and state cancer societies. Twenty prints have been distributed abroad. The final five films in the medical teaching series, which will be completed and released within the next two years, will be devoted to cancer of the breast, the gastrointestinal tract, the uterus, the lung and esophagus and intraoral cancer.

Venereal Disease Research Meeting.—A meeting on venereal disease research, sponsored jointly by the American Venereal Disease Association and the Experimental Therapeutics Study Section, National Institutes of Health, will be held in Washington, D. C. April 27-28. The first day will be devoted to papers on experimental syphilis, early syphilis and the newer antibiotics for syphilis. The afternoon session on Friday will feature a panel discussion on the international aspects of venereal disease control, papers on the treponemal immobilization tests and the epidemiology and serology of syphilis. The program for each day will be held in the Thomas Jefferson Auditorium, U. S. Department of Agriculture, beginning at 10 a. m. All persons interested are invited. Inquiries should be addressed to: Mr. Francis L. Schmehl, Executive Secretary, Experimental Therapeutics Study Section, Division of Research Grants and Fellowships, National Institutes of Health, Bethesda 14, Md., or to Dr. William L. Fleming, Secretary, American Venereal Disease Association, 750 Harrision Avenue, Boston.

Communicable Disease Summary.—The reported incidence of influenza in the nation increased for the week ended March 4 from 14,510 cases the preceding week to 24,632. For the corresponding week last year 4,067 cases were reported. The cumulative total for the first 9 weeks of this year is 88,828 as compared with the corresponding cumulative total of 41,338 for 1949. A report has not been received from North Dakota. Some of the larger increases were in Colorado (from 226 to 612), Georgia (from 209 to 443), Kentucky (from 27 to 358), Montana (from 383 to 1,541), Oklahoma (from 543 to 1,297), Texas (from 8,549 to 10,738), and Virginia (from 2,377 to 5,524).

Increases over the preceding week may be noted in reported cases of pneumonia (2,448 to 2,945), measles (8,167 to 9,580), scarlet fever (1,854 to 1,931) and whooping cough (2,446 to 2,959). Decreases from the previous week occurred in diphtheria (149 to 143) meningococcic meningitis (85 to 81) poliomyelitis (97 to 82), typhoid and paratyphoid (46 to 40) and rabies in animals (168 to 151). Two cases of smallpox were reported, one each in Arkansas and Oklahoma.

CORRECTION

The Hektoen Institute.—The exhibit on "Congenital Heart Disease" was awarded a bronze medal at the Illinois State Medical Society meeting and first prize at the meeting of the Mississippi Valley Medical Society in St. Louis, not of the American Academy of Pediatrics meeting in San Francisco, as was stated in THE JOURNAL February 18, page 495.

Marriages

JAMES LEROY MORGAN, Norfolk, Va., to Miss Doris Ellen Loflin of Greensboro, N. C., January 21.

ROBERT V. CROWDER JR., Lynchburg, Va., to Miss Marjorie Rea of Greenwood, December 31.

STANLEY W. BRUMMETT, Leigh, Neb., to Miss Katherine Garrick of Omaha, recently.

ALFRED M. STONE, Boise, Idaho, to Miss Marie Holland of Salt Lake City, January 28.

J. MALCOLM ASTE to Miss Nancy Donelson, both of Memphis, Tenn., January 26.

ELMER E. TERRELL, Paris, Ill., to Miss Marjorie Cammon of Olney, recently.

Deaths

Claude Worrell Munger ● Wollaston, Mass.; born in Orleans, Ind., May 24, 1892; Rush Medical College, 1916; superintendent of Columbia Hospital in Milwaukee from 1917 to 1921; formerly medical director of Blodgett Memorial Hospital in Grand Rapids, Mich., Grasslands Hospital in Valhalla, N. Y., and St. Luke's Hospital in New York; served as professor of hospital administration at Columbia University in New York; special lecturer at the Inter-American Institute for Hospital Administrators in Lima, Peru, in 1944; president in 1936-1937 and formerly vice president and trustee of the American Hospital Association, which in 1949 presented him with its award of merit; past president of the Hospital Association of Greater New York; a trustee and past president of the New York State Hospital Association; co-founder of the Wisconsin State Hospital Association; since 1941 vice president of the Hospital Council of Greater New York; member of the New York Academy of Medicine, Medical Society of the State of New York, American Public Health Association, National Committee for Mental Hygiene; in 1946 president of the Medical Superintendents Club of North America; formerly chairman of the Westchester County Council of Social Agencies, chairman of the committee on hospital exhibit, New York World's Fair; member and secretary of the subcommittee on hospitals, Council on National Defense; member of the White House Conference of Children in a Democracy, 1939-1940; consultant for the U. S. Public Health Service; member of the advisory commission to the Federal Hospital Council; member of the Commission on Hospital Care National Study from 1944 to 1947 and of the Joint Commission on Education of the American Hospital Association and the American College of Hospital Administrators in 1945; coorganizer of the wartime service bureau of the American Social Hygiene Association; consultant to the Federal Security Agency on hospital affairs, on procurement and assignment of physicians and on the nurse supply board and to the National Research Council on hospital and surgical supplies; on the editorial board of *Modern Hospital;* died in Boston February 3, aged 57, of cerebral hemorrhage.

Arthur Henry Morse ● New Haven, Conn.; born in Salem, Mass., in 1880; Johns Hopkins University School of Medicine, Baltimore, 1906; instructor in obstetrics at his alma mater, 1910-1911; instructor in obstetrics and gynecology at the University of California Medical School in San Francisco from 1913 to 1915, when he joined the faculty of Yale University School of Medicine as an assistant professor of gynecology, in 1920 became clinical professor of obstetrics and gynecology, in 1921 professor of obstetrics and gynecology and chairman of the department, serving until 1948, when he became emeritus professor; member of the American Gynecological Society, New England Surgical Society, the Society of Experimental Biology and Medicine and fellow of the American College of Surgeons; specialist certified by the American Board of Obstetrics and Gynecology; resident obstetrician at Johns Hopkins Hospital, 1910-1911 and resident surgeon at Union Memorial Hospital, 1911-1912, both in Baltimore; associate gynecologist at University of California Hospital in San Francisco, from 1911 to 1913; assistant obstetrician and gynecologist at the New Haven Hospital from 1910 to 1921 and from 1921 to 1947 obstetrician and gynecologist in chief; consulting obstetrician and gynecologist to the Grace-New Haven Community Hospital; consulting gynecologist at the Meriden (Conn.) Hospital; died January 27, aged 69, of a ruptured abdominal aortic aneurysm.

David Townsend ● Bristol, Tenn.; born in South Natick, Mass., May 6, 1873; Harvard Medical School, Boston, 1901; member of the American College of Chest Physicians, American Academy of Tuberculosis Physicians, National Tuberculosis Association, Massachusetts Medical Society and the American Trudeau Society; served during World War I; at one time associated with the Boston Dispensary and the Boston Consumptives' Hospital; formerly medical director of the Jordan Memorial Hospital in River Glade, N. B., Canada; for many years affiliated with the Johnson City National Sanatorium in Johnson City, later known as the Mountain Branch of the National Home for Disabled Volunteer Soldiers; served as medical superintendent of the King's Mountain Hospital in Bristol, Va.; died in the Massachusetts General Hospital, Boston, February 1, aged 76, of carcinoma of the bladder.

H. Lawler Wilder ● Pampa, Texas; born in Graham, Texas, Aug. 11, 1876; University of Texas School of Medicine, Galveston, 1899; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society and the American College of Radiology; served as councilor and president of the Panhandle District of the State Medical Association of Texas; secretary of the Top "O" Texas County Medical Society; was interested in Boy Scout activities and in 1945 received the Beaver Scout Award for distinguished service; served on the staffs of the Wheeler (Texas) Hospital and the Worley Hospital, where he died January 28, aged 73, of coronary occlusion.

Joseph William Charles ● St. Louis; born in Boonville, Mo., 1868; Washington University School of Medicine, St. Louis, 1891; an Associate Fellow of the American Medical Association; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology and the American Ophthalmological Society; fellow of the American College of Surgeons; served on the staff of the Missouri Baptist Hospital; formerly on the faculty of St. Louis University School of Medicine; died in the Barnes Hospital February 10, aged 81, of diverticulosis and gastrointestinal hemorrhage.

Clinton John Altmaier ● Marion, Ohio; Ohio Medical University, Columbus, 1905; also a graduate in dentistry; formerly a medical examiner for the Ohio State Industrial Commission; for many years surgeon for the Marion Steam Shovel Company; served during World War I; trustee of Ohio State University, Columbus, from 1937 to 1944; affiliated with the Marion City Hospital; died January 10, aged 67, of carcinoma of the stomach.

Abner Joachim Anderson, Ephraim, Utah; Indiana University School of Medicine, Indianapolis, 1921; member of the American Medical Association; city physician; died January 30, aged 62, of coronary thrombosis.

John James Basso, Brooklyn; Boston University School of Medicine, 1929; member of the American Medical Association; died recently, aged 57.

Herman Louis Bernheimer, Terre Haute, Ind.; Medical College of Ohio, Cincinnati, 1899; member of the American Medical Association; affiliated with the Union Hospital, where he died February 1, aged 81, of stones in the common bile duct.

William Gibson Berry, Jackson, Miss.; Memphis (Tenn.) Hospital Medical College, 1903; served during World War I; died in the Veterans Administration Hospital, Memphis, Tenn., January 24, aged 68, of acute leukemia.

Barton Brown, Savannah, Ga.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; member of the American Medical Association and the Medical Society of the State of Pennsylvania; served during World War I; for many years in charge of the U. S. Quarantine Station; died in the U. S. Marine Hospital January 29, aged 82, of arteriosclerotic cardiovascular renal disease.

James G. Brown, Woodville, Va.; University of Pennsylvania Department of Medicine, Philadelphia, 1889; member of the American Medical Association; died February 15, aged 82, of paralysis agitans.

William Christopher Burke, Brooklyn; University College, Dublin, Ireland, 1927; member of the American Medical Association; affiliated with Victory Memorial Hospital and St. Mary's Hospital, where he died January 4, aged 45, of gastric hemorrhage and lobar pneumonia.

Theodore Livingston Chase, Reno, Nev.; Hahnemann Medical College and Hospital of Philadelphia, 1891; founder of the Agnes Barr Chase Foundation for Cancer Research at Temple University; died in Temple University Hospital February 12, aged 84, of cirrhosis of the liver, cholelithiasis and cholangitis.

William Franklin Clary Jr., Memphis, Tenn.; Vanderbilt University School of Medicine, Nashville, 1903; member of the American Medical Association; served overseas during World War I; died January 30, aged 74, of heart disease.

William F. Cole, Dallas, Texas; Columbian University Medical Department, Washington, D. C., 1889; died January 7, aged 92, of congestive heart failure.

Edgar Wells Crass ● Chicago; Dearborn Medical College, Chicago, 1906; died February 14, aged 74, of lobar pneumonia and cerebral arteriosclerosis.

Paul Eli Cunningham ● Franklin, Pa.; University of Pittsburgh School of Medicine, 1910; served as bank director and coroner; on the staff of Franklin Hospital, where he died February 9, aged 63, of cerebral thrombosis.

Orville Adam DeLong, Elizabethtown, Ind.; Physio-Medical College of Indiana, Indianapolis, 1891; member of the American Medical Association; served during World War I; formerly county physician; honorary staff member of the Bartholomew County Hospital, where he died January 29, aged 82, of hiccup and bronchopneumonia.

● Indicates Fellow of the American Medical Association.

Walter Sharber Dooley, Crossville, Tenn.; University of Tennessee Medical Department, Nashville, 1910; member of the American Medical Association; served as president of the Cumberland County Medical Society; died January 24, aged 64, of coronary occlusion.

William Aloysius Dougherty, San Francisco; Cooper Medical College, San Francisco, 1899; died January 24, aged 75, of bronchogenic carcinoma.

David Burris Draper, San Jose, Calif.; St. Louis University School of Medicine, 1921; member of the American Medical Association; affiliated with O'Conner Hospital and San Jose Hospital; died January 16, aged 54, of coronary occlusion.

John Esser ● Perham, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1908; served as mayor, village health officer and member of the state board of health; affiliated with St. James' Hospital, where he died January 27, aged 66, of coronary thrombosis.

Harold Josselyn Everett, Portland, Maine; Medical School of Maine, Portland, 1907; member of the American Medical Association and the New England Obstetrical and Gynecological Society; past president of the Cumberland County Medical Society; served during World War I; affiliated with the Maine Eye and Ear Infirmary, Mercy Hospital and Maine General Hospital, where he was at one time president of the staff; died January 5, aged 66, of coronary occlusion.

John Parham Holmes ● Macon, Ga.; Vanderbilt University School of Medicine, Nashville, Tenn., 1911; served during World War I; on the staff of Macon Hospital; died in Emory University Hospital, Atlanta, November 21, aged 64, of hypertension and cerebral hemorrhage.

Alfred William Jackson, Albion, N. Y.; University of the City of New York Medical Department, 1892; University of Buffalo School of Medicine, 1894; member of the American Medical Association; died in Carlton January 30, aged 83, of carcinoma of the sigmoid colon.

Harry Everett Kirkpatrick, Itasca, Ill.; St. Louis University School of Medicine, 1903; member of the Missouri State Medical Association and the American Medical Association; formerly practiced in St. Louis, where he was affiliated with the Josephine Heitkamp Memorial Hospital; died recently, aged 78, of coronary thrombosis and cerebral hemorrhage.

William B. Lovingood, Maryville, Tenn.; Tennessee Medical College, Knoxville, 1904; member of the American Medical Association; for many years county physician; affiliated with Blount Memorial Hospital; director of the Bank of Maryville; died January 23, aged 77, of coronary occlusion.

Christine Elizabeth Lyman, Omaha; John A. Creighton Medical College, Omaha, 1903; died November 25, aged 80, of cerebral thrombosis.

Hugh Earl Mantor, Edmonds, Wash.; Omaha Medical College, 1902; fellow of the American College of Surgeons; died January 20, aged 75, of cerebral hemorrhage.

John Gore Massie, Belleville, Ill.; Missouri Medical College, St. Louis, 1898; died in St. Elizabeth Hospital February 10, aged 72.

Hazen Hooker Miner, Chicago; Harvey Medical College, Chicago, 1897; member of the American Medical Association; formerly surgeon for the Atcheson, Topeka and Santa Fe Railway in Kansas; died in Round Lake, Ill., February 2, aged 82, of cerebral arteriosclerosis.

James L. Newell, St. Louis; Beaumont Hospital Medical College, St. Louis, 1896; died in Deaconess Hospital January 21, aged 81, of myocardial infarction.

Houston Haddon Parsons ● Coos Bay, Ore.; University of Virginia Department of Medicine, Charlottesville, 1907; fellow of the American College of Surgeons; served during World War I; died in Veterans Administration Hospital, Portland, January 9, aged 64, of cerebral thrombosis.

Austin Flint Quire, Lynnville, Iowa, Keokuk Medical College, College of Physicians and Surgeons, 1901; died January 15, aged 80, of pernicious anemia.

Charles Rembe, Lincoln, Ill.; Missouri Medical College, St. Louis, 1878; member of the American Medical Association; for many years president of the high school board of education; died January 21, aged 93, of cardiovascular renal disease.

Clifford E. Sanders, St. Louis; Barnes Medical College, St. Louis, 1909; member of the American Medical Association; served as secretary of the St. Louis County Medical Society; died January 25, aged 66, of heart disease.

Lowndes Walton Shaw ● Savannah, Ga.; Atlanta Medical College, 1915; affiliated with St. Joseph's and Warren A. Candler hospitals; died January 26, aged 57, of acute coronary thrombosis.

Clarence Jonathan Slocum ● Beacon, N. Y.; Albany (N. Y.) Medical College, 1897; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association and the New York Academy of Medicine; a director of the Fishkill National Bank; affiliated with the Vassar Brothers Hospital in Poughkeepsie and Craig House, where he died January 28, aged 76, of coronary occlusion.

Benjamin Franklin Smith, Burns, Ore.; Medical Department of Tulane University of Louisiana, New Orleans, 1908; member of the American Medical Association; formerly associated with the Indian Service; manager and owner of Valley View Hospital; died January 29, aged 65.

Benjamin Andrew Stockdale, Circinnati; Kentucky School of Medicine, Louisville, 1891; died in the Good Samaritan Hospital December 29, aged 84, of hypertensive cardiovascular disease.

Albert Fales Stuart, Portland, Me.; Medical School of Maine, Portland, 1900; member of the American Medical Association; for many years associated with the U. S. Public Health Service; died January 25, aged 74.

Perry Kennedy Sullenberger, Eureka, Calif.; Northwestern University Medical School, Chicago, 1944; member of the American Medical Association; affiliated with St. Joseph's Hospital; died recently, aged 30.

Harold Stanley Sumerlin ● San Diego, Calif.; Indiana University School of Medicine, Indianapolis, 1917; specialist certified by the American Board of Pathology; member of the College of American Pathologists and the American Society of Clinical Pathologists; served in the U. S. Navy during World Wars I and II; on the staff of Mercy Hospital; died in Los Angeles January 31, aged 57, following an operation for bronchogenic carcinoma.

John Ellsworth Taylor, Leopold, Ind.; St. Louis College of Physicians and Surgeons, 1899; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; member of the American Medical Association; for a time postmaster of Leopold; died in the SS. Mary and Elizabeth Hospital in Louisville, Ky., January 13, aged 80, of pneumonia.

James Thompson, Morgantown, W. Va.; University of Cincinnati College of Medicine, 1919; member of the American Medical Association; affiliated with Heiskell Memorial and the Monongalia General hospitals; died February 6, aged 57, of hypertensive cardiovascular renal disease.

Robert Walter Todd, Phenix City, Ala.; Atlanta College of Physicians and Surgeons, 1912; director of the county health department; for many years affiliated with the Georgia State Health Department; at one time on the faculty of the Louisiana State University School of Medicine, New Orleans, and director of public health administration for the Louisiana State Board of Health; served during World War I; died in the Phenix City Memorial Hospital January 12, aged 61.

Marcus R. Van Baalen ● Detroit; Michigan College of Medicine and Surgery, Detroit, 1904; died January 30, aged 66, of congestive heart disease.

Samuel Arthur Waterman ● Miami, Fla.; Northwestern University Medical School, Chicago, 1894; an Associate Fellow of the American Medical Association; member of the Illinois State Medical Society; at one time practiced in Chicago, where he was affiliated with the Englewood Hospital; died in the Jackson Memorial Hospital February 18, aged 81.

John Jacob Westermann III, East Hampton, N. Y.; New York Medical College, Flower and Fifth Avenue Hospitals, New York, 1944; certified by the National Board of Medical Examiners; served during World War II; member of the American Medical Association; died in Southampton (N. Y.) Hospital January 27, aged 31, of injuries received in an automobile accident.

William Walter Whorton, Birmingham, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; died January 10, aged 71, of carcinoma of ureter with metastasis.

Fred J. Woods, Lincoln, Neb.; Lincoln Medical College of Cotner University, 1897; died in Vancouver, B. C., Canada, January 24, aged 82.

Frank Arthur Yonkam, Moorpark, Calif.; National Medical University, Chicago, 1902; member of the American Medical Association; died January 5, aged 73, of cerebral vascular accident.

Foreign Letters

PARIS

(From a Regular Correspondent)

Jan. 15, 1950.

Fourth International Congress of Neurology

The fourth International Congress of Neurology, one of the most important since the war, was held in Paris Sept. 5-10, 1949, under the presidency of Professor Alajouanine.

ELECTROENCEPHALOGRAPHY AND ELECTROMYOGRAPHY

Bremer (Brussels, Belgium), in his report on the physiologic basis of electroencephalography, stressed the importance of the study of the alpha rhythm. The alpha waves appear to be mainly due to centrifugal discharges of pyramidal cells of the cortex, and Bremer has studied the phenomena of neuronic synchronization and desynchronization and the reaction of stoppage and electrophysiologic structure of cerebral waves. According to the author, the spontaneous cortical activity represents continuous neurotonic vibration, which provides for the continuous exchange of dynamogenic and inhibitory influx, characterizing the functioning of the nervous mechanism; together with the sensorial influx, on which it is dependent, it contributes to the maintenance of the functional solidarity of the synergic centers and the hierarchic subordination of the various stages of the neuraxis.

Jasper (Montreal, Canada) stressed that in epilepsy electroencephalography greatly facilitates discrimination between crises due to a focal epileptogenic lesion, an atrophic, diffuse cerebral lesion, an extracerebral cause and idiopathic epilepsy due to an unknown etiologic factor. A diagnosis must always be based on the concordance between clinical facts and results of the electroencephalogram; a negative electroencephalogram must sometimes be ignored.

Denis Hill (London, England), after having defined what he means by psychomotor epilepsy, studied electroencephalographic diagrams between and during psychomotor crises and came to the conclusion that there is no specific diagram of psychomotor epilepsy.

F. Buchthal (Copenhagen, Denmark) reported on electromyography in the diagnosis of central and peripheral lesions of the nervous system. He has studied the problem of the steady spontaneous electrical and mechanical activity released in the course of poliomyelitis by the most minute passive movements. These spasms are admitted for the muscles of the neck and the rachis; their occurrence in other muscles was discussed by various authors; Buchthal found no abnormal electric behavior in the course of the three Danish epidemics, but he doubts the possibility of distinguishing, by means of the electromyogram, organic tremors and those of psychoneurotic origin.

THALAMUS

W. H. Le Gros Clark (Oxford, England) stated the present problems concerning the anatomy of the thalamus. It is probable that the nuclei projecting toward the cortex are not only relaying centers but also sorting centers for the separation and the regrouping of afferent impulses which are transformed in specific secondary impulses before being transmitted to the cortex. He stressed the necessity of standardizing the nomenclature of the thalamic nuclei on the basis of the American terminology.

Ludo van Bogaert (Antwerp, Belgium) limited his study to the proper pathologic anatomy of the thalamus, i. e., to nonfocal lesions, and took up the problem of degeneration. He investigated whether there are, at the level of the thalamus, systematized degenerative processes of the same order, for example, as the one of the cerebellum. The author's study has led to an idea of great importance: the thalamus appears today as a nucleus "containing" a part of the cortex under a particular form.

W. R. Hess (Zurich, Switzerland) dealt with the experimental physiology of the thalamus and especially with the motor functions. J. Lhermitte, de Ajuriaguerra and Hecaen (Paris) presented a clinical study of the thalamic syndrome.

ULTRAVIRUS DISEASES OF NERVOUS SYSTEM

W. H. D. Hammon (San Francisco) in his report on the etiology, epidemiology and diagnosis of encephalitic viruses stressed that the most important group of encephalitides originated from viruses transmitted by arthropods, which raises a problem concerning their spread by rapid international transportation.

P. R. Lépine (Paris Pasteur Institute) emphasized that the efficacy of antirabic vaccination is indisputable but that sometimes failures of an unknown origin occur. Researches are in progress for the preparation of a vaccine either by a better attenuation (ultraviolet), from which foreign substances are extracted with methyl alcohol or benzine while their antigenic value is preserved, or by the preservation of vaccines, after desiccation, in the frozen state and also for the association of a renewed serotherapy by means of gamma globulins. Results will show whether present failures are due to insufficient or too slow immunization, to the character of the virus or to the defense of the nervous system. In Europe the virus of lymphocytic choriomeningitis is only responsible for a small number of cases of lymphocytic meningitis and antibodies revealing an old or latent infection are only found occasionally in normal subjects, against a rate of 11 per cent found by Armstrong in the United States. Sven Gard (Stockholm, Sweden) said that since the discovery of the Lansing strain and the M.M. strain by Jungeblut and Dalldorf, the question of the homogeneity of the virus of poliomyelitis is open and that until the establishment of a definite nomenclature great caution in the designation of new strains is to be exercised.

G. M. Findlay (London) discussed the problem of cellular sensitivity to infection by viruses. Sabin (Cincinnati) proposed a classification of the virus infections of the human nervous system.

THE SURGERY OF PAIN

H. Krayenbuhl and W. Stoll (Zurich) reported 8 cases of leukotomy and 1 case of topectomy performed for relief of pain due to different causes. Contrary to others they found that all patients favorably influenced by the operation have manifested personality disorders and incontinence, and that 2 patients not improved have shown neither modification of their personality nor incontinence. A frontal syndrome with loss of initiative and puerile euphoria, without serious damage to the mnemic functions, was observed in certain patients after operation; psycho-organic disorders with an amnesic syndrome were noted in others. Relapses, coinciding with a new general alteration of the personality, are customary after a few months. The authors think that, whatever the cause of pain, surgical intervention suppresses not the perception of pain but only the reaction it produces. These operations according to the author ought to be performed only on patients for whom there is no hope otherwise.

O. Sjoqvist (Stockholm) dealt with the surgical section of tracts and channels of the transmission of pain in the spinal cord and the cerebral trunk, for which he proposes a new terminology. Since 1941 he has performed 58 anterolateral cordotomies (which he calls spinothalamic tractotomies), among which, in 14 cases of arthritis deformans of the hip, he has noted 2 excellent results, 9 good and 3 unfavorable. The author compared his 29 medullar trigeminal tractotomies with 166 radicular sections (among which 159 were performed with

Frazier and Spiller's method and 7 with Dandy's); he is of the opinion that the indications of tractotomy are limited by the higher mortality and the more frequent complications and relapses; he reserves the procedure for ophthalmic neuralgia and bilateral neuralgia of young patients.

TREATMENT OF PAIN BY SYMPATHETIC METHOD

R. Leriche (Paris) stated that sympathectomy gave excellent results in the pain of the stumps of amputees. Arteriectomy and periarterial sympathectomy have given complete recoveries lasting five to nine years, and ganglionectomy has resulted in recoveries lasting twenty years. In pain in the missing limb, repeated blocking with vasoconstrictors has produced an abatement lasting several years; the results of ganglionectomy are inconstant, and relapses may occur after radiculectomy and cordotomy. He pointed out the first satisfying results of a new method of modification of the cicatrization of nerves, consisting in the injection of procaine by means of a special device twice daily during fifteen days. He stressed the interest of the sympathetic method as a means of analysis of the mechanism of pain. By a series of roentgenograms he showed that in painful stumps there is often arterial thrombosis or spasm and a development of new vessels between the osseous extremities and the skin. In this event he has found in the skin small neoform neuromas and abnormal glomera, having a part probably in the genesis of pain.

SURGICAL TREATMENT OF MIGRAINE

In a series of experiments G. F. Rowbotham (Newcastle-upon-Tyne, England) severed the tracts of transmission of pain. The most useful operation appears to him to be a partial section of the posterior radix of the trifacial nerve in the fossa media, but there is a danger of keratitis. He has also tried sympathectomy at various levels. This operation offers practically no danger, but it produces an impression that the nose is being obstructed on the same side and a Claude-Bernard-Horner syndrome. In 3 cases he has severed the superficial large petrosal nerve in the skull and in another series he has tried suppressing the peripheral structures by vascular sections. Corticectomy and bilateral prefrontal leukotomy are of no use in the treatment of migraine. The author emphasized the difficulty of assessing the results because of the periodic character of this disease. He pointed out the order in which the surgical interventions may be performed.

W. Penfield (Montreal) lectured on the cerebral localization of functions and on the clinical classification of various epilepsies. Two interesting exhibits were shown at the Faculty of Medicine: one, by Dr. Hebb Waymaker, concerned the history of neurology and the other, by Dr. Pearce Bailey (Washington, D. C.) concerned the method used in the United States of America for the reeducation of hemiplegic and paraplegic patients.

REPORT OF COMMITTEE FOR THE UNITED STATES

The following additional information concerning the Fourth International Congress of Neurology was submitted by the committee for the United States (Henry A. Riley, chairman; H. Houston Merritt, secretary; Stanley Cobb; John F. Fulton; Foster Kennedy, and S. Bernard Wortis).

The Congress was held under the sponsorship of the President of the French Republic and the Minister of Foreign Affairs. Formal invitations were issued to the State Departments of all the constituent countries, inviting official representatives of the departments of State, Army, Navy and Air Force. The Soviet Union was formally invited to the Congress and was kept apprized of all preliminary proceedings, but no response was obtained from the U. S. S. R. Previous congresses were held in Berne, Switzerland (1931), London, England (1935) and Copenhagen, Denmark (1939). The fourth congress was to have been in Paris in 1943, but this plan was rendered inoperative by World War II.

The opening session was held in the amphitheater of the Sorbonne under the chairmanship of the French Minister of Health. Official speeches of welcome were made by Prof. L. Binet, Dean of the Faculty of Medicine; Professor Barre for the French Society of Neurology; Dr. Garcin, secretary-general; Professor Brouwer for the foreign members and Professor Alajouanine, president of the Congress. The remainder of the first morning session was devoted to a symposium on electroencephalography and electromyography. The succeeding Tuesday, Thursday and Friday morning sessions were held at the Faculté de Medicine and were devoted to special topics. The afternoon sessions of Monday, Tuesday, Thursday and Friday were devoted to miscellaneous topics. Thirty separate sessions held in the various amphitheaters were devoted to the basic problems in neuroanatomy, neurophysiology, neuropathology and electroencephalography, clinical neurology and neurologic surgery. Wednesday forenoon was devoted to a tour of the Salpetriere Hospital with a formal meeting devoted to the dedication of a memorial plaque in memory of Prof. J. J. Dejerine. The presentation was made by Mme. Dr. Sorrel-Dejerine, the daughter of Professor Dejerine. The afternoon was devoted to an excursion to the Palace of Versailles.

The Saturday morning session was devoted to a consideration of the status of neurology. The official action of this session was the adoption of a resolution calling for the activation of a program directed toward the firmer establishment of neurology "as an independent specialty in the field of medicine in all countries." It was further specified in the resolution that the various therapies in the treatment of diseases of the nervous system should be considered the primary responsibility of the neurologic specialty. An international committee was appointed to carry out the purposes of this resolution, with Dr. Pearce Bailey, Washington, D. C., as chairman, Dr. A. B. Baker, Minneapolis, vice chairman and the vice presidents of the Congress as members.

The opening social exercise of the Congress consisted of a reception at the Centre Marcelin Berthelot. A reception was held also at the invitation of the president and the members of the Municipal Council of Paris at the Hotel de Ville de Paris; an address of welcome was presented by Monsieur Charles de Gaulle, the president of the Municipal Council.

The official banquet on September 4 was attended by over 800 members and guests of the Congress. At the conclusion of the banquet the president, Professor Alajouanine, announced various awards made by the French Government as follows:

To the Order National Legion of Honor with:

I. The grade of Commander:
   - A. Austregesilo, of Brazil, Professor of the Faculty of Medicine at Rio de Janeiro.

II. The grade of Officer:
   - G. Monrad-Krohn, of Norway, Professor of the Faculty of Medicine at Oslo.
   - Ludo Van Bogaert, of Belgium, Professor of the Faculty of Medicine at Antwerp.
   - John F. Fulton, of the United States, Professor of Yale University.

III. The grade of Chevalier:
   - G. G. Rademaker, of Holland, Professor of the University of Leyden.
   - Percival Bailey, of the United States, Professor of the Neurological Institute at Chicago.
   - Henry Alsop Riley, of the United States, Professor of Clinical Neurology, College of Physicians and Surgeons, Columbia University.
   - Knud Krabbe, of Denmark, Professor of the Faculty of Medicine at Copenhagen.

To the Order de la Santé Publique with:

I. The grade of Officer:
   - Dr. Pearce Bailey, Washington, D. C. (United States)
   - Professor Kaila, Helsinki (Finland)
   - Dr. Laruelle, Brussels (Belgium)

II. The grade of Chevalier:
Professor Asenjo, Santiago (Chile)
Dr. Austregesilo Dilho, Rio de Janeiro (Brazil)
Professor Biemond, Amsterdam (The Netherlands)
Dr. Patrikios, Athens (Greece)
Dr. Subirana, Barcelona (Spain)
Dr. Knud Winter, Copenhagen (Denmark)

The membership of the Congress was divided into active and associate members; in the former category 1,440 were registered, with 1,038 in attendance. The United States provided the largest number of members, with 199 enrolled and 137 registered. In all, forty-six countries were enrolled and forty-three were represented by attending members. The transactions of the Congress will consist of the résumés, abstracts and discussions of the papers presented and will be printed by Masson et Cie, 120 Boulevard St. Germain, Paris VIe.

To prepare plans for the fifth International Neurological Congress, which will be held in Lisbon, Portugal, in 1953, a preliminary meeting of the officers of the fourth International Neurological Congress, constituting the Program Executive Committee, will be held in Lisbon in 1951.

ITALY

(From a Regular Correspondent)

FLORENCE, Jan. 5, 1950.

Congress of Urology

At the Twenty-Second Congress of the Italian Society of Urology, in Rome, Professor Ascoli of Milan and Professor Cominelli of Naples presented a report on "Errors and Failures of Renal Surgery." Professor Ascoli discussed the causes of diagnostic and therapeutic failure in the field of surgical intervention on the kidney. He included ignorance, negligence, absence of thought or of critical spirit, technical imperfection and excessive conservatism. In the medical treatment of surgical diseases of the kidney various errors may be encountered: Insistence on a prolonged period of treatment of renal infections with antiseptic or antibiotic therapy, without drug resistance being taken into account; overlooking treatment of the intestines in colibacilluria; administration of hexamethylenetetramine and its derivatives to patients with alkaline urine and omission of treatment to prevent concentration of the urine in carriers of renal stones.

Errors in therapeutic indications are due frequently to errors in performing or interpreting function tests. The tests on blood and urinary elimination may be misleading because of urinary, renal or vesical retention. The tests of water exchange may be misleading when the exchange through the blood and tissues is altered by profuse sweating, diarrhea, vomiting or circulatory stasis. Azotemia is deceptive in the presence of fever and in some other circumstances. Polyuria may misrepresent the results of the chromocystoscopic test and those of urea determination.

Professor Ascoli listed the causes of failure of intervention on the kidney as follows: (1) exaggerated traction or intense and prolonged trauma of the pedicle, which may cause anuria, (2) waiting more than five days before performing the intervention when anuria is present, (3) intervention in cases of renal tuberculosis in patients who present only bacilluria in the absence of roentgenologically significant lesions, (4) intervention on patients with aseptic renal calculosis or in the absence of pain or without dilatation of the pelvis and (5) omission of a discharging pyelotomy in nephrotomy when one cannot rely on hemostasis and when there is the risk of superdistention. Another error may consist of omission of exeresis of the major part of the surrounding tissue in cases in which a nephrectomy is performed for a malignant tumor. A more serious error is performance of an emergency intervention in cases of renal trauma without ascertainment that the function of the remaining kidney is adequate.

In cases of hypertension resulting from a unilateral renal lesion one must be careful first to draw conclusions with respect to the etiologic relationship between hypertension and renal lesion, and only then to proceed with nephrectomy. It is necessary always to remember that surgical intervention in medical nephritis provides little chance of success, and only in acute forms, never in chronic and nephrotic forms. The speaker concluded his report with the statement that the major part of errors in urology must be attributed to insufficient technical equipment and to the scarcity of diagnostic material and specialized personnel.

The second speaker, Professor Cominelli, listed five groups of errors in the diagnosis of renal diseases which are of interest from the surgical point of view: (1) nervous, painful or functional reflexes of such intensity as to simulate symptoms of distant organs or of such intensity as to transform a condition, which originally appears to be a dystonia and to be reversible, into an anatomic and irreversible one, and that because of the persistence of the stimulus; (2) nervous, painful and functional reflexes which are able to provoke directly, or by means of toxicosis or dysendocrisiasis, changes of the nervous tonus and of the cellular trophism of the internal organism; (3) morphologic changes, with or without anatomic lesions, consisting of deformation of the renal apparatus—being abnormal with respect to volume and position, they may cause repercussions in other viscera; (4) anatomic or functional changes which the renal disorder may be able to provoke in other organs, and vice versa, because of continuity or adjacency or through the lymphatics or blood vessels, and (5) changes of roentgenologic iconography which may be produced in the kidney by disorders of other viscera or by unknown changes of other parenchymal zones different from those which apparently were impaired or by abnormal conditions with respect to volume or position. According to the speaker, many of the errors which may be committed with respect to diagnosis of surgical renal diseases are due to omissions, and a major part of them could be avoided by a more careful performance of the roentgenologic examinations or the instrumental examinations.

The assembly of the urologic society ascertained the large number of hematurias following the employment of coumarin and its derivatives and formulated a note to be sent to the High Commissioner of Hygiene and Public Health to call attention to such occurrences and to invite the physicians to a strict control of patients who submit to such treatment.

The next congress will be held in Palermo in October 1950, and the subject on which reports will be presented will be "Surgical Treatment of Malignant Tumors of the Bladder."

Hyporthyroidism and Menstrual Disturbances

At a meeting of the Medical Academy "Filippo Pacini" in Pistoja, Professor Santi discussed the hyperthyroid syndromes, and the disorders of ovarian function in women with toxic diffuse goiter. In 50 cases of hyperthyroidism the disease was classified as neurogenic, hypophysial, of primary thyroid origin or peripheral; 50 per cent of the patients had menstrual disturbances. The speaker stated that, while cases with primary hypophysial pathogenesis are associated with menstrual disorders more frequently than toxic diffuse goiter of other pathogenesis, he had not observed a definite relation between the type of toxic diffuse goiter and the type of menstrual disorder. However, the type of menstrual disorder presented may depend on a variety of disturbances. There are two possibilities: (1) a common mechanism applicable to all types of toxic diffuse goiter and based on (*a*) the thyroxine action on the diencephalic centers which regulate the genital functions and (*b*) the modifications of sensibility of the ovary due to the action of gonadotropic hormones stimulated by the thyroxine itself; (2) a variable mechanism according to the various pathogenetic types

of toxic diffuse goiter, in which the hypophysis, on the basis of a preexisting lability, is the center of primary importance. There are reflex disturbances in hyperthyroidism of primary thyroid origin, while direct disorders are manifested in primary hypophysial hyperthyroidism. This accounts for the greater frequency of menstrual disorders in cases of hypophysial toxic diffuse goiter. The diencephalic neurogenic center which regulates the genital function is directly involved in other instances. The speaker suggested also the possibility of a purely psychic origin.

Papal Messages to Physicians

The *Orizzonte Medico* (Medical Horizon), the periodical of the association of the Catholic physicians in Italy, initiated the collection and publication of the messages given by the Pope Pius XII to physicians during his pontificate. The present Pope has always shown interest in medicine, the problems of health and the physicians. During the war the Holy See has made numerous provisions of sanitary character, and only recently an international meeting of medical specialists took place at the Pontifical Academy of Science; cancer was the subject of this meeting.

There were eight papal messages collected in the volume edited by *Orizzonte Medico*. These messages were given from 1944 to 1948. Noteworthy among them are those given to the surgeons of the allied armies (1944), to the directors of the American Red Cross (1947) and to the participants of the World Assembly of Health (1949). Recently the Pope has given still another important message to the physicians who attended the Fourth International Congress of Catholic Physicians.

TURKEY

(From a Regular Correspondent)

ANKARA Jan. 19, 1950.

Multiple Sclerosis

Dr. Lutfi Kirdar, who for the past ten years was governor of the province of Istanbul and mayor of that city, has recently been elected deputy of Magnisa to the National Assembly in Ankara. Ord. Prof. Fahreddin Kerim Gökay of Istanbul University has succeeded Dr. Kirdar as governor and mayor of Istanbul. Dr. Gökay is president of the Turkish Mental Hygiene Society and a busy specialist, and has presided over the Green Crescent, the Turkish alcoholic society, for twenty years.

At the 1949 international neurologic congress in Paris, Professor Gökay reported on multiple sclerosis, Charcot's disease. Between 1933 and 1948 the Istanbul university neurologic department of the Bakirköy Mental Hospital admitted 3,128 patients; of these, 125 had multiple sclerosis; 96 (76 per cent) were men, and 29 (24 per cent) were women; the majority of the patients were between 40 and 60 years of age; 43 patients were farmers or unskilled workers, 26 were housewives; 19 were civil servants; 7 were businessmen; 8 were artists; 4 were students; 3 were professional workers, and 15 had no specific occupation. In 8 patients "moral shock" was the specific cause, in 6 malaria, in 6 undiagnosed infection, in 6 physical trauma, in 2 meningitis, in 2 postpartum complications, in 1 syphilis, in 1 jaundice, in 1 pneumonia and in 1 enteritis. In the remaining 91 patients the cause remained unknown. Investigation revealed that one of these patients had an epileptic sister, one had a brother suffering from multiple sclerosis and in the family of one patient there was a case of syphilis. In 57 of the 125 patients the clinical form was cerebellopyramidal, in 32 cerebellar, in 24 pyramidal, in 4 dementia, in 4 cranial nerve paralysis, in 1 ocular nerve paralysis, in 1 pseudotumor and in 1 myoclonia; 1 involved the peripheral nerves. In the 125 patients the symptoms revealed the loss of the abdominal reflex in 102 instances, cerebellar incoordination in 101, loss of sense perception 101, increase in cremasteric reflex 99, positive Babinski sign 98, nystagmus 83, dysarthria 62, defective vision 61, ankle clonus 43, intentional tremor 42, impotence 21, menstrual changes 20, depression 17, cranial nerve paralysis 16, sphincter incontinence 15, trophic disturbances 5, vestibular defect 4, convulsions 2 and auditory defect 1. Cerebrospinal fluid, blood and urine were normal in all patients except for albuminuria in 2 patients. There was no change in the hemograms, leukocyte counts or sedimentation rates, nor was any inflammatory process involved. The Wassermann reaction was strongly positive in 1 patient; 4 patients had a plus-minus reaction, and in all other patients the reaction was negative. Urinalysis revealed increase in cells in 1 patient; in 10 patients the albumin had increased. The result of the globulin test was positive in 2 patients and strongly positive in 31 patients; chloride increased in 5 cases, and in 3 cases it was below normal. The Wassermann reaction of the cerebrospinal fluid was always negative. In 16 cases the colloidal benzoin test revealed a slight deviation.

Until 1930 multiple sclerosis was rare in Turkey. The researches of Professor Guillain and his associates have greatly aided its diagnosis, with a resultant increase in recorded incidence.

Control of Malaria

Malaria control in Turkey started in 1925. In the initial stages there were five antimalarial campaign zones; in 1944 there were 19 zones in 33 of the country's 63 provinces, comprising 108 districts (Kazas) with 4,615 villages and a population of 3,650,068. There were 151 physicians and 563 sanitary inspectors. In 1949 there were 41 zones in 54 provinces, comprising 301 districts with 12,543 of the country's 40,000 villages with 9,616,675 of Turkey's 19,000,000 population. For centuries malaria has been Asia Minor's scourge, jeopardizing health and taking its toll among the people living in the vicinity of the swamps and along river beds.

When the republic was established in 1923, the first concern of the Ministry of Health and Social Assistance was the malaria situation. At present there are 293 specialist physicians and 1,178 specially trained sanitary inspectors engaged in 41 zones, and deaths from malaria have become rare. The malaria campaign work is in the hands of the Ministry of Health in Ankara and under the direction of a director general, in collaboration with a counselor on technical matters and 2 sanitary engineers. Difficulties in procuring dichlorodiphenyltrichloroethane (DDT) at the termination of the war have in the past four years been overcome. The generous supply of DDT from the United States, resulting in the extermination of Anopheles and their breeding places, and the free distribution of quinacrine hydrochloride and quinine are some of the factors that brought about the good results of the campaign. This was achieved at the cost of 5,000,000 Turkish pounds from the government budget. Having witnessed the effectiveness of the application of DDT, which also eliminated other insect-borne diseases and household pests, the people gave their fullest cooperation; in several villages the people even financed the extermination of Anopheles. Statistics show that in 1943, of the 11,092 patients treated for acute malaria, 657 of the most seriously affected died; in 1948 there was a mortality of only 91 of 4,459 patients.

Small swamps are drained, standing water and other breeding places in the vicinity of villages are disposed of with the help of able-bodied men, who by law are required to give five days of unpaid work once a year; thus land has also been reclaimed for cultivation. The work is directed and controlled by the chiefs of the administrative units; they tour the area in jeeps which United States aid has enabled the government to supply.

District physicians tour the villages on horseback or in horse-drawn wagons. Sanitary inspectors go to the villages daily; they receive a monthly allowance for the maintenance of the horse. Once a month the chiefs of the administrative units send a report to the Ministry of Health.

At the Adana Malaria Institute chlorguanide hydrochloride is being used. Because of its strong schizontocidal property and also because it reduces the long cycle relapses, it is preferable to quinine. It is too early to evaluate fully the clinical results. Research is being carried on in the Adana area. The yellow color of the body which follows the use of quinacrine hydrochloride does not occur with use of chlorguanide hydrochloride, but the latter is several times as expensive as quinacrine. This is an important factor in a country like Turkey, where great quantities are still needed. The antimalarial drug chloroquine diphosphate has not yet been tried enough to permit evaluation. Quinacrine, quinine, sulfaguanidine and other medicaments are distributed free of charge, the expense incurred being met by the Ministry of Health.

The birth and death rates have been favorably influenced by the control of malaria. In 1943 the birth rate in the malaria region was 29 per thousand and the death rate 19.68; in 1945 the death rate had dropped to 12.37. In 1948 the birth rate was 30.5 and the death rate 11.45. The use of sulfaguanidine has also considerably reduced the infant mortality from summer diarrhea. In 1932 the infant mortality rate was 107 per thousand births; in 1948 it was 78.9.

ISRAEL

(From a Regular Correspondent)

JERUSALEM, Feb. 1, 1950.

Health of Jews in Middle East Countries

Though the Ministry of Immigration and the Jewish Agency try where possible to cure would-be immigrants suffering from contagious diseases before they emigrate, in cases of urgency such patients are brought to Israel and taken care of in hospitals in the country.

Dr. P. Koren, Director of the Ministry's Medical Examination Department for Foreign Countries, who has just returned from a trip to Europe, North Africa and Middle Eastern countries, reported that the health condition of the Jews in the Middle East and North Africa was deplorable. These people were suffering from malnutrition, skin diseases and trachoma, he said, and medical services were almost nonexistent. It was the poor, Dr. Koren added, who wanted to come to Israel most urgently, but it was among them, too, that most sickness was found.

REHABILITATION CAMPS

Under the system now in operation, would-be immigrants are medically examined in their countries of origin and given immediate visas for Israel only if found mentally and physically fit, except in cases of entire communities' moving to Israel (like the Yemen) and in countries where there was only one opportunity to get the Jews out.

To rehabilitate and cure those suffering from contagious diseases and others found unfit for immediate immigration to Israel, two main camps had been set up under the auspices of OSE (World Union for Protection of Health of Jews) and the Joint Distribution Committee, in Marseilles and Algiers. In the Marseilles camp 1,500 of the 6,000 inmates needed medical treatment, and modern equipment was being used to help them. A special convalescent center had been set up for tuberculous children.

Most of the sick remain in Marseilles for three to four months under the supervision of doctors, nurses and workers from Israel. More personnel, however, are needed. Medical service is also available in the Algiers camp, which was established on a smaller scale.

The final clearing stage has been reached as far as the camps in Germany and Austria are concerned, only the sick, whose emigration was delayed, having still to be transferred. Illness has also delayed the immigration of many persons from the Scandinavian countries, Belgium and Switzerland.

Labor Sick Fund (Kupath Cholim) Figures

With the increase in its membership of 150,000 during 1949, Kupath Cholim announced on January 15 that the incidence of various diseases had also risen as compared with figures in 1948. Between July and November there were 69 typhoid cases compared with 47 during the same period in 1948, and 99 cases of paratyphoid, as against 66 cases. Kupath Cholim pointed out that there was no cause for anxiety, since, considering the large scale immigration, the typhoid figure was comparatively low. The incidence of malaria and recurring malaria cases was rising. There were 547 cases as against 417 during the same four month period in 1948, and 500 of recurring malaria compared with 135 the year before. The dysentery figure of 3,499 cases was also very high, but not higher than last year. There was a rise in the number of cases of infantile paralyses, 33 compared with 9, but a drop in those of diphtheria.

Camp Population Drops 25 Per Cent

The immigrant camp population has dropped almost 25 per cent in the past six weeks. There were 79,800 in camps on January 1 compared with 104,000 in the middle of November. Some 41,000 were in tents. The reversal of the trend of rising congestion in the camps is due to the drop in immigration. While according to official figures there were about 20,000 immigrants monthly in September and October, 13,321 came in November and 14,006 in December. The immigration rate is now back at the level it was before the "Magic Carpet" operation from Yemen reached its peak. A total of 239,171 arrived in 1949.

About 10,000 persons have moved to four work camps in areas where workers are needed for water pipeline construction, road building, forestation, irrigation works and building. Temporary dwellings in the camps were provided by the Jewish Agency. Another camp, for 1,500 bachelors, is being opened this month in Kastine. They will work on development projects in the northern Negev (Southern Israel).

Housing has made good progress during the six weeks under review, and a Jewish Agency Absorption Department official estimated that 22,000 immigrants had left their camps during that period for permanent homes in cities, towns and communal settlements.

The Problem of Hospital Beds

Speaking to the press Dr. Josef Mayer, Director-General of the Ministry of Health, said that there were now 3,600 beds in public hospitals, as compared with 1,900 last year. They included 925 beds for children, as compared with 225 only six months ago.

The Yemenite newcomers presented a tremendous problem, Dr. Mayer said. Nearly 40 per cent suffered from malaria, and many had developed tropical ulcers during their wanderings from the Yemen to Aden. The undernourishment was staggering. Four new hospitals, each with a 100 bed capacity, will be constructed in Israel for Yemenite camps by the Joint Distribution Committee, Mr. Moshe Levitt, executive vice chairman of the Joint Distribution Committee, announced in January 1950.

In addition, the committee has under consideration the building of additional hospitals in Israel with a capacity of 1,000 beds. It is planned to expand and improve existing Israel

hospitals and erect several homes for the aged. Six hundred hospital beds are to be set up for tuberculous patients within the next four months by the joint efforts of the Ministry of Health, the Joint Distribution Committee and the Jewish Agency. Buildings for the treatment of tuberculous patients have been made available in the northern part of Israel after an urgent demand recently submitted to the Prime Minister by the Minister of Health and Director General of the Ministry.

Meeting of Neurologists in Jerusalem

Nearly two hundred psychiatrists, neurologists and guests met in Jerusalem last November. The sessions were devoted to developments in psychiatry and neurology, particularly the social psychologic problems of the absorption of new immigrants, and proposals for drafting legislation regarding the trial in court of psychopathic delinquents.

Dr. Lewenstein, president of the association, deprecated the practice of persons without proper medical training setting themselves up as psychiatrists or psychoanalysts. He said that the association had made proposals to the Ministry of Health for legislation to safeguard the standard of the psychiatric profession. He also pointed out the dire need of proper institutions for mental patients, which has greatly increased with the present mass immigration. The Ministry of Health has established new mental hospitals at Beer Yaakov and Acre, the Kupath Cholim has opened a new mental hospital at Talbieh and a psychotherapy clinic in Tel-Aviv and the Hadassah has opened a mental hygiene and child guidance center in Jerusalem. More institutions of a similar nature are urgently required. Mr. Herman Cohen, the Attorney-General, sketched the ideal legislation required for the trial of psychopathic delinquents. At one of the sessions a symposium was held on the results of the first prefrontal leukotomies performed in cases of grave mental disease in Israel.

COLOMBIA

(From a Regular Correspondent)

Bogotá, Feb. 20, 1950.

Centennial of Faculty of Medicine

The Faculty of Medicine of Cartagena observed its centennial anniversary on January 9. Festivities were held January 9-14. The founders of the faculty were the late Drs. Rafael Calvo L., Vicente A. García and Jerónimo Morales. Up to 1905 the faculty was a sectional institution. It became autonomous in 1905 through Law 100 of the national government, which legalized autonomy of the faculty and national and professional recognition of the titles given by the faculty. The festivities included a reception given by the deans of the faculties of medicine of Cartagena city and of the country. There were scientific programs and exhibits. Dr. Moisés Pianeta Muñoz, dean of the faculty of medicine of Cartagena, made a speech at the banquet. The deans of the faculties of medicine of Colombia gave addresses in the course of the last conference. The conclusions reached were: 1. The teaching systems should be equal in the faculties of medicine. 2. Teachers of basic subjects (anatomy, physiology, pathologic anatomy and biochemistry) should work full time. 3. The law on medical services by which physicians are required to work in rural districts for the first year after their graduation, which was recently established by the government, should be changed to read that physicians should work during the first year after graduation as interns in hospitals.

Treatment of Arteritis Obliterans

Drs. J. Hernando Ordóñez, T. Henao, V. Hernán Dueñas and E. Rubio recently lectured before the Society of Biology of Bogotá. The lecturers dealt with the treatment of arteritis obliterans. They presented 2 patients with senile arteritis obliterans, who had undergone surgical treatment, consisting of end to end anastomosis, between the central end of the femoral artery and the distal end of the femoral vein, and ligature of the saphenous vein. The anastomosis was made at the level of the triangle of Scarpa. The operation was carried on with spinal anesthesia. Ligation of the internal saphenous vein was done on the same day as the anastomosis in one case and 67 days after anastomosis in the other. No. 7-0 silk was used for the arterial sutures. Oxidized cellulose was applied about the anastomosis. Improvement was pronounced in one case and moderate in the other. Both patients were old and in poor health. Heparin and dicumarol® were not used. There were no complications. Both patients had deficient circulation, but there was no gangrene. The clinical symptoms improved after the operation. However, oscillometric readings did not change. In the first few days after operation the foot is colder than before operation. Slowly the temperature increases and the foot improves. Edema appeared in the foot after the operation in 1 case and lasted one week. The condition of the foot, after the operation, with engorged veins in the first few days after operation and regression of venous blood engorgement later, indicates that venous hypertension is transient.

The authors believe that the operation is of value. However, its value should be determined by the results of the operation in cases of advanced Raynaud's disease, thromboangiitis obliterans and senile gangrene. The results of the reported cases were verified by arteriography.

Calculation of Size of Heart

Dr. Gonzalo Esguerra Gómez of Bogotá in a recent lecture before the National Academy of Medicine presented a new formula for calculation of the size of the heart of children by teleradiography. Before preparation of this formula the speaker made calculations of the size of the heart of 480 normal adults who always had lived in the high plateaus of Bogotá. The calculations were based on the measures of the anthropometric index (stature and weight) and of the transverse diameter of the heart, by using the constant initially proposed by Ungerleider and Clark, which he modified to calculate weight in kilograms and stature in centimeters. The author studied the roentgenograms of a 20 year collection of Dr. Marion Maresh of Colorado, United States. It consisted of 3,205 roentgenograms of 128 children aged 3 years and up. He observed a relation between the transverse diameter of the heart and the anthropometric index, which is the same for children between the ages of 4 and 8 years as for normal adults. This relation is slightly modified in children and adolescents from 9 to 16 years of age, with a deviation of 3 per cent, which is explained as caused by an accumulation of fat in the subcutaneous cellular tissue during the growing period. The result of the constant is approximately 2.47 to 2.50. On this basis the author transformed the primary formula into a secondary one, in which the transverse diameter of the heart is equal to the square root of the product of division of weight, times stature. From this formula the author made a rule of calculation by means of which the transverse cardiac diameter is obtainable both in children and in adults, if one knows the weight and stature in kilograms and centimeters or in pounds and inches, respectively.

New Hospital for Tuberculous Patients

The new 500 bed hospital of San Carlos for tuberculous patients is located at the Llano de Mesa, at the south territory of Bogotá. The hospital was built with a generous donation of the late Don Gustavo Restrepo. The cost was about 5,000,000 Colombian pesos. It has modern equipment, and Dr. Pedro José Almanzar is the director. The plans for the hospital were made by Mr. Hugh M. Garden of the firm Smith, Garden & Erickson of Chicago, Illinois.

Correspondence

MECHANISM OF ACTION OF METHYLENE BLUE IN TREATMENT OF METHEMOGLOBINEMIA

To the Editor:—In a recent editorial on "Methemoglobinemia in Infants" (THE JOURNAL 141: 534 [Oct. 22] 1949) you state, "Why methylene blue should be effective in the treatment of methemoglobinemia has not been explained. . . . The administration of a methemoglobin-forming agent to patients suffering from methemoglobinemia would seem illogical, but clinical experience demonstrates that methylene blue does act as a specific in the treatment of this condition." This apparent paradox is resolved, I believe, by the work which my associates and I published in 1947 (Gutmann, H.; Jandorf, B. J., and Bodansky, O.: *J. Biol. Chem.* 169: 145, 1947; Bodansky, O., and Gutmann, H.: *J. Pharmacol. & Exper. Therap.* 89: 46, 1947). We found that two reactions are possible in a hemoglobin-methemoglobin-methylene blue system. The first is a direct oxidation of hemoglobin to methemoglobin by methylene blue; the second is a reduction of methemoglobin to hemoglobin which requires the reduced form of the coenzyme, diphosphopyridine nucleotide, and which is accelerated greatly by methylene blue. On the basis of our experimental results we formulated the second reaction as follows: the reduced form of diphosphopyridine nucleotide interacts with methylene blue to give diphosphopyridine nucleotide and leucomethylene blue. Leucomethylene blue then interacts with methemoglobin to yield hemoglobin and methylene blue. These reactions continue in a cycle as long as a continuous source of reduced diphosphopyridine nucleotide is available as a result of glycolytic processes. The removal of substrate or the inhibition of glycolysis by fluoride or iodoacetate interferes with the production of reduced coenzyme; hemolysis results in the enzymatic destruction of the coenzyme. In the absence of coenzyme, reduction of methemoglobin to hemoglobin cannot occur.

Contrary to the usual impression, methylene blue is not a good methemoglobin former in vivo in man. Nadler and his associates in 1934 (*Am. J. M. Sc.* 188: 15, 1934) injected intravenously 50 cc. of a 1 per cent solution (about 7 mg. per kilogram of body weight) into 18 normal men and found methemoglobin ranging from 0.4 to 8.3 per cent of the total blood pigment. In contrast, much smaller intravenous doses of methylene blue (1 mg. per kilogram) reduce methemoglobin content in dogs of about 50 per cent to one-half this value in about thirty-five minutes. It is also apparent from the survey we made of the clinical literature that a small intravenous dose of 1 to 2 mg. of methylene blue per kilogram of body weight is highly and rapidly effective in reducing severe methemoglobinemia in man.

These considerations permit the following formulation. When methylene blue is injected into man, there are two reactions: (1) direct oxidation of hemoglobin to methemoglobin, and (2) an opposing reaction, the reduction of methemoglobin to hemoglobin, for which coenzyme is necessary. Apparently, the latter reaction is much more effective, so that the equilibrium state between the two reactions is pitched at a point of very low methemoglobin concentration. This equilibrium is arrived at whether methylene blue is injected into a person with no methemoglobinemia or one with a high degree of methemoglobinemia.

OSCAR BODANSKY, M.D.,
Memorial Hospital and the Sloan-Kettering Institute for Cancer Research, New York.

FIVE YEAR CURE OR CONTROLLED FIVE YEARS?

To the Editor:—Clinical evidence indicates that cancer patients who are well and free of disease at five years show reactivity in a substantial percentage during subsequent years. Personal experience in lay cancer education and contact with members of the medical profession on both coasts and in the middle west during the past fifteen years has brought this weak spot into focus. As reviews of five, ten, fifteen and twenty year end results appear there will be a better understanding of treatment methods and so-called cancer cure rates. Some clinicians have adopted the term five year survival with or without disease. The term survival, though understood by the profession, is not ideal for the lay public, because the word is generally associated with the unexpected and is tinged with pessimism.

In an address before the Los Angeles section of the American College of Surgeons, Stuart Harrington presented a twenty year follow-up study of mammary cancer treated at the Mayo Clinic. The graphic curves showed a diminishing salvage as the result of death from recurrent or metastatic cancer in the group of five year "cured" patients. At the Los Angeles Tumor Institute the latest five year cure rate of stage 1 carcinoma of the cervix reported by William E. Costolow is 82.9 per cent. Previous studies of 70 patients followed ten years by Costolow showed a loss of 18 per cent by death from reactive disease. It is probable that the most recent five year cure rate will show a comparable adjustment at the end of ten years. From these frank appraisals and other reports it might be concluded that a careful survey of all reported five year and ten year end results will show similar recurrent rates and death from distant metastasis.

In a prolonged battle or campaign a strategic retreat with consolidation of gains provides the means of a more sustained forward advance at some future date. Is it not time in the fight against cancer to explain to the public and to the profession at large what a given patient may expect after the hard won goal of five years? Many physicians and patients believe that the five year goal means freedom from follow-up examinations. Cancer patients are often neglected between the fifth and tenth years because of this doctrine of cure rather than control. Some of these patients with reactive disease can be reoperated on or treated with radiation methods to advantage. Physicians and the public should realize that the treatment of cancer is one of continued control after the five year goal has been passed. Such a program will not only salvage more lives but detect still other unsuspected growths.

Cancer can be cured or entirely eradicated by surgical intervention, radiation therapy or a combined technic in a high percentage of its early and occasionally of its advanced manifestations, but because of unknown factors many of these apparently cured patients are prone to reactivation of the lesions after long periods of quiescence. In specialized forms of the disease, such as cancer of the reproductive organs and glands of internal secretion, the gross disease may be removed by successful radical surgery, only to leave behind residual microscopic malignant neoplastic cells. In such instances the patient may die within months of overwhelming disease, or the residual malignant cells may be held in check or in a dormant state of physiologic balance between inherent growth inhibitors and growth stimulators. The actions of hormones, vitamins, enzymes and complex chemicals are being studied in research laboratories in this country in order to evaluate this little understood mechanism.

If the cancer patient is to profit by treatment, it is suggested that a common sense attitude be maintained by the patient, the family physician, the surgeon and the radiologist for an indefinite period of time—not for five years but a recheck examination at least once a year for life.

J. Samuel Binkley, M.D., Tumor Institute, Los Angeles.

ROENTGENOGRAMS OF THE CHEST

To the Editor:—The roentgenogram has during the past few decades become one of the most important diagnostic aids. Because of the ease with which one may be taken and the important information derived therefrom, the roentgenogram of the chest is by far the most frequently taken; the patient is usually in the posteroanterior or anteroposterior position. I should like to emphasize some pitfalls existing in this policy which should be taken into account in interpreting survey or individual roentgenograms.

The chief hazard is that a lesion may be present and not be noted even in a posteroanterior roentgenogram of good technical quality. The danger exists that a lesion of significant size may lie hidden behind the cardiac shadow. Such lesions include diaphragmatic hernias, posterior mediastinal tumors and cancers of the lung—the last two often in a resectable stage. I have examined several patients during the past few months because they had vague and nonspecific complaints which did not point to the thoracic cavity. Though the posteroanterior chest roentgenogram was not of much assistance, the lateral view revealed the source of the patient's difficulties. It is my opinion that a lateral roentgenogram of the chest should be made for any patient who seeks a diagnostic evaluation, especially those with nonspecific complaints like fatigue and weakness, weight loss and vague diffuse soreness as well as for complaints referable to the thoracic cavity. Until it becomes possible for all physicians to take a lateral roentgenogram on every patient, larger institutions that are able to do so by virtue of equipment and trained personnel should routinely take several views, so that the number of lesions missed by a single view may be ascertained. If the number of lesions that are detected solely because of combined view studies proves statistically significant, current procedures employed by hospitals and physicians in chest roentgenology will have to be revised.

In the roentgenographic surveys of chests being conducted throughout the country, a large number of lesions have been found. No survey has to my knowledge instituted a follow-up program so that the number of pathologic processes missed can be determined. The percentage may be small but significant. It is admittedly difficult and also expensive to start a follow-up program. This should be done, however, because it is obviously important to know the limitations of any diagnostic survey. Persons receiving a roentgenogram without cost should feel obligated to report back after six months for an interview and/or reexamination. If the number of lesions missed is shown to be relatively large, the cause may be readily determined and corrective procedures may be instituted.

Though the roentgenogram with the patient in the posteroanterior position is adequate for detecting tuberculous lesions, this is not true with regard to other pathologic conditions of the thoracic area. The number of other serious abnormalities in the chest detected because of combined view studies, especially in persons over 35, in my opinion warrants the extra expense involved in taking the additional roentgenogram. No diagnostic evaluation of a patient with obscure disease can be considered complete unless a lateral roentgenogram of the chest has been taken.

Seymour Lionel Halpern, M.D., New York.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Forty-Sixth Annual Meeting, Held in Chicago Feb. 5, 6 and 7, 1950

February 6—Morning

Dr. Herman G. Weiskotten, Syracuse, N. Y., Presiding

The Responsibility of a Profession for the Promotion of Educational Standards

Dr. Herman G. Weiskotten, Syracuse, N. Y.: This paper will be published in full in The Journal.

Survey of Medical Education: Preliminary Observations

Dr. John E. Deitrick, Chicago: This paper will be published in full in The Journal.

The Study of Grants and Financies

Dr. Lowell J. Reed, Washington, D. C.: In October 1948 the National Advisory Health Council recommended that the Surgeon General appoint a committee to undertake a study of the effects of Public Health Service grants on medical school finances and on medical education and to determine what further steps should be contemplated for the improvement and extension of medical education. The growing financial difficulties of medical education have for some time been a source of deep concern to medical educators. Furthermore, during the past few years the Public Health Service has been charged with responsibility for administration of significant sums of money for medical research and training. The service has become one of the principal sources of support for medical research throughout the country. The importance of these programs is keenly felt by the National Advisory Councils and the Surgeon General.

The committee undertook to collect expense and income data to describe the current financial structure of medical schools. Preliminary analysis reveals that total basic instructional expenses for all seventy-nine medical schools combined amounted to $53.4 million for the fiscal year 1947-1948. The forty-four private schools spent $30.6 million and the thirty-five public schools spent $22.8 million. Percentage distribution of expenses shows that two thirds went for direct instruction (salaries and equipment) and that there was no significant difference between private and public schools in this respect. Research budgeted separately (from basic instructional expenses) is a sizeable item in medical school operation; total 1947-1948 expenses reached $17.1 million. The $12.2 million spent by the forty-four private schools represented $40 for each $100 spent on basic instruction. The $4.9 million research expenditure of the thirty-five public schools amounted to $21 for each $100 for instruction.

One part of the study was devoted to an analysis of the distribution of Public Health Service grants approved or renewed during the year ended June 30, 1949. During the study year the National Institutes offered four types of project grants to support research and training, namely, training grants for cancer and mental health, research grants, construction grants for cancer research facilities and special cancer project grants. In addition there were stipends for traineeships in cancer and mental health and for research fellowships. All grants and stipends approved or renewed during the study year amounted to a total of some $17 million. Three fifths of the amount went for research, and three fifths of the total went to medical schools. Public Health Service research funds constituted one fourth of all medical school expenses for research budgeted separately.

Analysis of the distribution of grants in relation to characteristics of the schools shows that: (1) there is close correspondence between the allocation of funds and medical school research capacity; (2) schools with smaller faculties receive more grants per faculty member than do schools with larger

faculties, but more funds per faculty member go to the larger schools; (3) private institutions receive more funds than public schools, and (4) the distribution of Public Health Service research funds parallels the distribution of similar funds by other agencies. A large majority of the deans maintain that research grants have not caused disproportionate emphasis on applied research. According to the deans, the categoric nature of research grants has not disturbed the patterns of research principally because the definitions of categories have been broadly interpreted by the National Advisory Councils. No dean has reported any interference by the National Institutes of Health. All but four of the deans believe that grants have improved the balance of undergraduate training. Two positive effects have been (1) greater financial support for training in previously undeveloped fields and (2) greater coordination of several departments or disciplines. Public Health Service grants, in the deans' opinions, have not restricted flow of funds from other sources. Several deans attributed increased financial support from states, communities and even foundations to the fact that the Public Health Service has granted funds to their institutions. The overwhelming majority of deans have expressed satisfaction with the manner in which the grant funds have been administered and are gratified with the effect of grants on the school's programs. However, I do not wish to give the impression that there are no criticisms or that deans did not offer suggestions for improvement, which will be given full weight in the final report.

The Location of a Medical School

DR. W. REECE BERRYHILL, Chapel Hill, N. C.: Most of us agree that the university campus is the ideal location for a medical school provided funds are available to insure modern physical facilities for laboratories, teaching and research, hospital clinics, wards and a faculty of a high order of excellence; provided patients sufficient in number can be assured for a sound teaching program for undergraduates and graduates, and provided the faculty and administration in addition to scientific and clinical accomplishments have an awareness of the mission of a modern medical school and of its importance in the total life of the community.

There are definite educational advantages in the close interrelationships between the medical school and the other professional schools of the university with public health, dentistry and pharmacy in the medical area and professional schools in the nonmedical area. The importance of cooperative research and graduate training programs between the graduate school departments of the natural and physical sciences and the medical school should be emphasized.

Two other advantages should be mentioned here: (1) the easy accessibility to the resources of a large university library is invaluable to the medical school, both educationally and administratively; (2) a close working arrangement with an active extension service, maintained as a part of the educational program of most state universities, provides important support for the medical school in its postgraduate program. By utilizing an existing university organization the medical school is enabled more effectively and more economically to extend its postgraduate training, both extramural and intramural, and its services throughout the state. There are advantages from the standpoint of the over-all university administration in having the medical school and hospital on the university campus. The centralization of administration, of accounting, of purchasing and of maintenance and servicing organizations reduces duplication of departments and staff, lowers the cost and promotes economy of operation throughout. University standards are more easily maintained and the medical school enjoys more freedom from "pressure groups"—medical and other—when it remains physically a part of a university. The easy accessibility of cultural and recreational facilities offered by a university are important considerations in the daily living of the medical, dental and nursing students—undergraduate and graduate, as well as the faculty. The location of the medical school on a university campus in a small community demands in large measure a full time faculty. From the standpoint of developing a sound educational and research program this is advantageous; furthermore, such an arrangement promotes a closely knit organization and an *esprit de corps* perhaps more difficult to achieve under other arrangements. With emphasis on teaching and research and with an adequate salary scale from the university, supplemented from a limited consulting practice with a definite ceiling on total income, a university environment becomes an added inducement in attracting and holding a competent clinical faculty. Another asset to the clinical teaching when the medical school is on the campus is the utilization of the student health service.

When the university is in a small town there are two disadvantages. 1. Adequate clinical material with a sufficient variety of disease states to insure a well-rounded teaching program must be provided. Most universities in small towns are now located amidst a network of good roads. Patients from rural areas can now travel 30 to 50 miles to a hospital in a small university town more easily than they can go from one end of a large metropolitan area to another. From the Florida report the following statement of Dr. Vernon Lippard is pertinent: "It is our opinion that a large population and a large number of part-time instructors are not essential to the development of a good educational program. The experience of medical schools in small communities has not indicated that they are handicapped seriously by lack of patients. If adequate facilities are provided and a superior faculty assembled, people find their way to the medical center in numbers and with a variety of illnesses more than sufficient to supply material for clinical observation." The experiences in this country at the Universities of Iowa, Virginia, Michigan, Wisconsin, Duke and Bowman-Gray and at the Mayo Clinic have over the years borne out the truth of this statement. With the spread of prepaid hospital and medical care insurance all teaching institutions must in the future look for a broadened economic basis from which to draw teaching material if they are to continue even their present sized classes. Experiments are under way in some institutions in using private patients for undergraduate teaching, and indications are that such an arrangement can be successful. This practice will almost certainly become commonplace in the near future as the indigent patient of the medical school days of twenty-five to fifty years ago is replaced by the part-pay or full-pay patient.

The argument has been advanced that the clinical material available for a teaching hospital in a small town is likely to be limited, especially in obstetrics, pediatrics and acute traumatic surgery. But this handicap is frequently a blessing in disguise because compensation can be and has been made for any shortage of clinical material through affiliation of the university hospital and medical school with special or general hospitals in neighboring centers of larger population. There are mutual advantages and opportunities in such an arrangement in that hospitals in other areas and competent part time clinical teachers are brought into the university's sphere of influence and additional clinical facilities and material are made available for undergraduate and graduate training programs. The level of medical care in such affiliated institutions is usually elevated to the benefit of the general public, perhaps an even more important consideration than that of furnishing teaching material for the medical students.

2. A second handicap is the lack of readily available qualified men in the specialties for part time clinical teachers, who are invaluable to medical schools. At the same time it is true that some medical schools have been forced to depend too largely on voluntary clinical instructors, over whom by the very nature of the local situation the institution exercises little control.

Few university medical schools located in small towns are not close enough to larger centers of population to avail themselves of the services of qualified part time clinical instructors. In that situation the university can exercise more freedom in its choice of part time staff members and has a larger measure of

control. Furthermore, these men, within a radius of 30 to 50 miles, are as easily accessible to the university hospital as are their professional counterparts in the large metropolitan areas, who may live an equal distance from and travel through more congested traffic to the teaching hospital for their clinic or teaching duties.

The University of North Carolina has been confronted with the problem of how and where medical education should be developed. Since 1879 the first two years of medicine have been taught on the University campus at Chapel Hill. Since the 1920s the problem of expanding the school has been studied by the Board of Trustees. Always there was the uncertainty of funds and the question of the best location. A commission of fifty prominent citizens studied the question of the location of the school and surveyed the whole medical and hospital needs of the state. Subsequently a survey committee reviewed the data, and the majority recommended that the school be expanded on the University campus in Chapel Hill provided "that the school of medicine and associated services of the medical center —i. e., a school of nursing, a program for training essential personnel in fields ancillary to rendering medical and hospital care, the existing School of Public Health, an active program for graduate and postgraduate education for physicians and allied medical personnel both at the Medical Center and throughout the state, arrangements to provide hospitals throughout the state with clinical consultations, roentgenologic, pathologic and other services as may be desired by them—be integrated effectively and continuously with a statewide network of hospitals and health centers in so far as these volunteer to cooperate, and that full utilization be made of the facilities of the voluntary, nonprofit hospitals of the state; that these institutions remain autonomous units, expected to operate with high standards of service as required to provide proper medical care to the people of the State." The University Administration and Board of Trustees, and the State Legislature, without a dissenting vote, accepted the report of the Survey Committee to expand the Medical School on the campus of the University at Chapel Hill. Probably the single most important reason for the final decision to place the Medical Center on the University campus lay in (*a*) the position of the University in the state and (*b*) the role envisioned for the Medical School in the over-all state hospital and medical care program.

The University of North Carolina from its beginning has been in a real sense a university of the people of the state, yet singularly free from political influence and pressures. It is the center of the state—not only geographically but educationally, culturally and spiritually. For over one hundred and fifty years the people of North Carolina have looked to Chapel Hill for help and for leadership in the development of all phases of their life. Adequate funds have been provided for the enlargement of the present Medical Science Building, for the construction of a 400 bed general hospital and clinic building, for an instructional building for the School of Nursing, together with a nurses home, a residence hall for house staff and a 100 bed tuberculosis hospital. Almost certainly a psychiatric unit of 50 to 100 beds will be added shortly. Construction of the Hospital and Clinic Building has begun.

Chapel Hill is a small community of 10,000 permanent residents, and the University has a student body of 7,500. Negotiations are being completed for affiliations with two general hospitals totaling approximately 800 beds within an hour's drive of the University. Within this area also are two mental hospitals with a capacity of 4,000 patients, for which the University Medical School already does the pathology and which will be available for other teaching activities. There are available in larger cities—within the 50 mile radius—capable men who are not only interested but anxious to serve as part time clinical instructors.

We believe it is possible for a medical school as an integral part of a university, even though it is located in a small community, to have all the educational advantages available in a university and at the same time to secure maximal results in its medical training program.

Locating a Medical School in a Metropolitan Area

DR. ROY R. KRACKE, Birmingham, Ala.: For many years there has been controversial discussion with respect to the location of medical schools. The ultimate decision is usually based on the amount of money available for construction of the physical plant and whether or not the institution can afford to own and operate a teaching hospital on a university campus. Large sums of money are usually necessary to develop medical teaching centers on campus locations. The construction of 250 hospital beds requires a minimum of $2,500,000 capital outlay in addition to the cost of educational facilities.

Five years ago the University of Alabama was confronted with the problem whether or not to locate its newly authorized medical school in a metropolitan area of the state, such as Birmingham with its population of 400,000, or on the University campus at Tuscaloosa with its population of 30,000. The final decision, by necessity, was made purely on economic grounds. The state of Alabama was not able to construct or to maintain a statewide hospital charity service on its University campus. The state was able to provide funds for building a medical school provided the capital outlay for teaching hospitals could be borne by some other governmental unit. One important advantage of location in a metropolitan area is the vast amount of clinical material available for teaching. The average graduate of the Medical College of Alabama delivers about 40 women by the time he graduates from school, in addition to having delivered 5 to 10 women on a Home Delivery Service. This is done under proper supervision and instruction. The students have opportunity to study a wide range of acute infectious and contagious diseases. In addition to our own large Pediatric Service, we maintain teaching affiliations with the Children's Hospital of Birmingham. We maintain an extremely active Accident and Emergency Service, which is responsible for the care of about 90 per cent of all accidents that occur in the Birmingham area. During 1949, 51,000 persons were treated on this service. The utilization of this large volume of clinical material in the educational process results in the student having had considerable practical experience in these fields. Furthermore, when a large volume of clinical material is present there is usually a wide variety of clinical conditions on the Inpatient Service, so he acquires a rather broad experience in the wards.

A second consideration in favor of a metropolitan location is the availability of large numbers of competent physicians to serve on the faculty of the school. The Medical College of Alabama has about one hundred and eighty physicians on its voluntary teaching faculty. This large group of teachers can be provided in addition to a substantial staff of part time and full time persons in key positions. It is important that a large voluntary faculty be available, because they are often able to present many important factors in the practice of medicine that are sometimes overlooked by a purely full time group. A large voluntary teaching staff usually incorporates a number of specialists that are usually not available in a more isolated campus situation.

Students who are taught by a group of full time and part time faculty members and a large number of voluntary faculty members, plus a large volume of clinical material, tend to be trained toward the lines of general practice rather than specialization. There seems to be general agreement that what this country needs in medicine more than anything else today is more general practitioners and fewer specialists. It follows, therefore, that an institution whose pattern of training is directed toward the general practitioners can do best under the conditions that are usually found in a large metropolitan area.

If a medical school is forced to utilize hospitals operated by other agencies, conflicts of a serious nature may easily develop. However, it is possible for the institution to be located in a metropolitan area and to own and operate its own teaching hospital in that area. The Medical College of Alabama owns and operates its own 600 bed teaching hospital, which services not only large groups of indigent patients but private paying patients, with students having an opportunity to work with both

groups of patients. We were fortunate to secure our teaching hospital by gift from the county, but it is easy to convince the people that a medical school can operate a hospital more successfully than could be done if it remains under political control.

It is often stated that one advantage of a campus location is the opportunity for close association of medical college faculty and student body with other units of a large university. During my own experience in this type of medical education, which includes some eighteen years at Emory University, where the preclinical years of the school were located on the University campus, I have had ample opportunity to observe these advantages, and in my opinion they are vastly overrated. The fact that the professor of anatomy may live next door to the professor of philosophy may be a social advantage, but the association stops at about that point. On the contrary, such close association may only serve to accentuate the fact that the former receives a higher salary than his colleague. Furthermore, such associations are not lost if the medical college is located in a metropolitan area, because in practically all metropolitan areas there are universities of one type or another in addition to research institutes, which, of course, are readily available for contact by medical college faculties. My impression is that the main advantage of the medical school being located on the university campus, as far as the faculty is concerned, is the chance for so-called cultural and educational contacts.

The fact that a medical school is located in a large city does not necessarily cut off its affiliations with scientific and educational groups. A close relationship exists between our faculty members and those of Birmingham-Southern College and Howard College, located close to us in Birmingham. Only one block away is the Southern Research Institute, which has a staff of some 70 full time men in the fields of physics, chemistry, biology and other basic sciences, with considerable cooperative research between the two groups.

Another consideration favoring a metropolitan location is the ever present opportunity of securing substantial monetary gifts for various phases of medical school activities. Our institution is relatively new in Birmingham, and our city is not distinguished by large groups of wealthy people. Nevertheless, our institution has been the recipient of a number of substantial monetary gifts, and this would not have been possible had the institution been located on a distant campus. For example, our Department of Ophthalmology operates at an annual budget of some $20,000 yearly, which would have been utterly impossible without the interest of local citizens in its activities. The fact that medical college faculty members have an opportunity to become intimately associated with persons of wealth and means in a metropolitan area always enhances the chances that gifts may be forthcoming to the school. An outstanding example of that is Emory University in Atlanta, where the people who are associated with the Coca Cola Company have given the institution millions of dollars. Had the institution been located at Oxford, Ga., as it was a hundred years ago, it is doubtful whether such outside interests would ever have developed.

A medical school in the metropolitan area has the greatest opportunity to become a real instrument of public service, which is what medical education needs to do. All our educational institutions, whether they be tax supported or privately endowed, are ultimately dependent on the generosity and interest of the public at large. On the one hand the operating expenses come from tax sources and on the other hand, through the medium of gifts. In either case, if the activities of the institution are publicized and if it is constantly demonstrated that the institution renders a real public service, its support will be greater in the years ahead. A medical college in the metropolitan area has splendid opportunities for demonstration of its value to the public welfare.

There are many areas in a metropolitan area where a medical school may become a forceful instrument of public service apart from its educational activities. Our Mental Hygiene Division works actively with the police courts and with the courts of juvenile delinquency. We collaborate in attempting to solve the problems of alcoholism and psychiatric conditions as we see them in a large metropolitan area. Our Obstetrical Division is responsible for all of the obstetric work at the local Salvation Army Home for Unmarried Girls. Our Departments of Ophthalmology and Otolaryngology assume full responsibility for the examination and treatment of 1,500 children at the state schools for the deaf and the blind. Our institution, being closely related to the public health division of our city and county, has great opportunities to do field work in this important aspect of medicine. Our faculty staffs complete the statewide Crippled Children's activities. We service a large Tumor Clinic, which is operated by the state of Alabama. In many important activities of medical public life the institution can leave its imprint on the practical problems of medical care throughout the area. As a general rule, the medical college located on the campus does not have these multiple opportunities for community service.

In the future medical colleges will be concerned with the care of the veteran. A large Veterans Hospital will be found in association with nearly every medical school. The basic policy of the Veterans Administration is that a veteran hospital is better located near a metropolitan medical school than near a campus medical school because in the event of collapse of either of the schools the hospital then would always be located in an area where a large number of competent physicians are available.

Medical students have certain advantages in a metropolitan area, including access to medical and scientific programs sponsored by local medical and professional groups. When the headquarters of the local medical societies are located in the school, as they are in Birmingham, student attendance at such meetings is a frequent occurrence.

Other advantages to medical students in metropolitan areas are the numerous opportunities for employment on a part time basis. Some believe that the cost of living for faculty and students is less in a campus area than in the metropolitan area, but in my opinion this is not true.

I am convinced that the advantages of a metropolitan location far outweigh the disadvantages of not being on the university campus, and this is particularly true if the institution is in position to own and operate its own teaching hospital. The future of medical schools will depend on the public service that the institutions render to their areas, but the public must be taught that, in addition to the service rendered by the schools, medical education is indispensable to the public welfare. This can be done only by projecting the activities of the medical school into every area and facet of community life. Opportunities for this course of action are far greater in a metropolitan area than they would be on any university campus.

FEBRUARY 6—AFTERNOON

Abstracts of the papers presented at this session will appear in a later issue of THE JOURNAL.

FEBRUARY 7—MORNING

DR. JACOB L. LOCHNER, Albany, N. Y., Presiding

Interstate Reciprocity by Medical Licensing Boards and Basic Science Boards

DR. JACOB L. LOCHNER, Albany, N. Y.: The New York State Legislature in 1940 repealed all reciprocity agreements for medical licensure. From that time on we have considered each application on an individual basis, and at present we will endorse the medical licenses of twenty-six states and Puerto Rico entirely on an individual basis with the idea that the applicant must meet our preprofessional and professional requirements in every respect. I have been disturbed with requests for endorsement of out of state licenses which our Committee on Endorsement could not endorse, particularly in cases of men who have been in practice fifteen or twenty years and in cases

of young physicians who have an opportunity for a position that would give them prestige and a fine salary. What can be done to change this situation? I doubt that any state legislature would consent to give up its authority in regard to medical licensure. The National Board of Medical Examiners was founded with that idea in mind; yet even now some states will not entirely endorse the National Board certificate, and several of the basic science boards refuse to endorse that certificate. I think that the Federation of State Medical Boards is the proper body to attempt an agreement on endorsement. Information concerning the breadth and scope of the state medical licensing examinations is important. I sent questionnaires to every state board and found that of the 48 state boards answering the questionnaire, 2 have an examination of one day, 15 of two days, 4 of two and one-half days, 21 of three days, 1 of three and one-half days and 5 of four days. Puerto Rico has a five day examination. Thirty-eight states will pass a candidate on an average of 75 per cent; 8 require 75 per cent in each subject of the examination; 3 require an average of 80 per cent in the examination; 6 require an oral examination in addition to the written; 3 require an oral examination for endorsement applicants; 1 requires an oral examination for National Board candidates; 2 require an oral examination for foreign graduates. In 2 other states the oral examination is at the discretion of the board of examiners. One state does not give any written examination but gives a brief oral examination to all candidates; 18 states indicate that there is a basic science board whose examinations have to be passed before a medical license can be issued either on the basis of examination or endorsement.

The majority of the basic science boards give examinations in either five or six subjects. At present eighteen states, the District of Columbia and the Territory of Alaska have basic science boards. The certificate of the National Board of Medical Examiners is accepted by only nine basic science boards. In ten states the Board of Medical Examiners will not give any credit for grades received in the examination of the basic science board. The original purpose of basic science laws was to exclude inadequately trained practitioners from being admitted to licensure. There is doubt whether or not they are accomplishing their purpose. Statistics indicate that the number of cultists examined in 1946 comprise only 3.5 per cent of the total number of 3,333 candidates. In order to control this 3.5 per cent of applicants for licensure plus 6 per cent of osteopathic candidates, the remaining 90 per cent (all graduates of approved medical schools and many with additional postgraduate training) are required to submit to basic science board examination. All but four of the basic science boards apparently have the discretionary power to endorse basic science examinations given in other states, but apparently many of them are not willing to exercise this power. Therefore the basic science boards offer one of the most important obstacles to more widespread interstate endorsement. To get an honest opinion from a member of the board of medical examiners in the basic science states as to what the basic science law had accomplished, I wrote to a member of the board in each basic science state. In the majority of states there is an absolute separation between the basic science board and the board of medical examiners. This is not a good situation, because both are primarily concerned with protecting the public from unqualified persons desiring to practice one of the healing arts. They should work together more closely and keep each other informed as to their policies and their examinations. I do not believe that anything less than a three day examination can be considered adequate to determine a candidate's right to licensure. If a three day examination could be considered the minimum as meeting the present day requirements, then at this time licentiates of twenty-seven states would meet that requirement. If the twenty-one states having less than a three day examination would increase their examination to three days, then all forty-eight states would meet the minimum requirements for endorsement. The majority of the medical boards examine candidates on an average of ten subjects, some of which would be classed as minor specialties and probably do not give a true cross section of the applicant's ability. The examination should be set up to test the ability of a man for all-round practice, and in this way the examination would offer the best protection to the public. In 1948 there were 7,584 physicians licensed by reciprocity. The greatest number was in California, where they had 1,270 endorsements; New York state was second with 959 and Massachusetts third with 392. The greatest number of candidates appearing before a state medical board was in the state of New York, where 797 were examined; Illinois was second with 556 and California was third with 494. The largest number of foreign graduates was in the state of New York, where 417 were examined. No other state came near that figure, the next being Illinois with 60. Practically all of the states, with the exception of California, require a two year premedical course; twenty-five states require a one year internship. Since the majority of physicians applying for endorsement have had more than two years of college and have had one or more years of internship, these two requirements do not pose much of a problem. It is my opinion that the matter of greater interstate endorsement is not insurmountable and can be solved by the adjustment by some boards of the type and scope of their examination and by the basic science boards cooperating more fully with the medical boards and endeavoring to make use of existing basic science laws in regard to waiver and endorsement.

Resettlement of the Displaced Physician

DR. ALEXANDER M. BURGESS, Providence, R. I.: This paper will be published in full in THE JOURNAL.

The National Health Service of Great Britain

WILLARD C. RAPPLEYE, M.D., New York: Probably it is not realized that the National Health Service of Great Britain had its beginnings in the French Convention of 1794, when the idea of sharing the economic risks of sickness and disability by spreading those hazards over a large population group was first expressed in modern times. The formulation of that philosophy was a direct result of the industrial revolution.

After the French Convention of 1794 a large variety of organizations arose to apply the principles of distributed risks in relation to many of the hazards to which employed persons are liable, including unemployment, old age, sickness and survivor benefits, pensions, funeral payments and other financial considerations. Germany, in 1883, was the first country to apply these principles on a nationwide scale. The immediate antecedents of the National Health Service in Great Britain were the various forms of contract practice which had grown up during the last hundred years. The Beveridge Commission on Social Insurance and Allied Services in 1942 recommended a complete national insurance scheme. The reports of the Medical Planning Commission and of the Beveridge Commission were accepted by the Coalition Government in 1942. The present Labor Government carried out the proposals after it came into power in 1945. The National Health Service Act was implemented on July 5, 1948. On the "appointed day" about 95 per cent of the population had signed up under the Act. Approximately 90 to 95 per cent of the medical practitioners and specialists and almost all of the chemists and ophthalmic opticians joined the service immediately. Although private practice under the National Health Service largely disappeared in many areas after the inauguration of the service, it is increasing again and persons are more frequently seeking private practitioners to avoid the long delays, the crowded and hurried office calls and the impersonal medical attention given to many patients on the Health Service lists.

The plans of the Ministry of Health include a large building program for medical and dental schools, hospitals, health centers, nursing units, convalescent homes and other features. The government has decided that it cannot go into this expensive program at the moment. The purposes of the Act were to place emphasis on preventive medicine through early recognition of disease and family medical services, but it has not been

possible to develop health centers or the long term preventive aspects of the program as originally proposed. Thus far the concern has been largely in filling prescriptions, catching up with the deficit in medical, dental and ophthalmic services, which had not been provided for under the previous National Health Insurance program, and other immediate and urgent health needs of the population.

Among the effects of the National Health Service is a loss of the sense of personal responsibility on the part of the general practitioner for the welfare of his patients. It is now possible for the doctor, even though he can prescribe and obtain all the medicines and appliances he needs for his patients, to pass the responsibility for time-consuming examinations or treatments to the hospitals, where specialists' services are provided free.

There has been in general a reduction in the initiative and incentive for self development and a loss of satisfaction on the part of many general practitioners. There have always been wide differences in the quality of services rendered by general practitioners, and those variations have been accentuated under the health service, often with lowering of the standards of practice. There is evidence that the role of the general physician in the National Health Service has declined from his previous status in British medicine, partly because of the greater influence of the consultants and hospitals in formulating the policies and organization of that service. However, it is possible for the conscientious practitioner to render more satisfactory services to his patients than previously, although he is handicapped by the heavy demands on his time for certificates, reports and prescriptions.

While the total cost is high, there seems to be general agreement that the National Health Service is operating on a reasonably satisfactory basis considering all the circumstances that exist in Great Britain. The underlying difficulties date back to the early years of this century, when Great Britain began to lose its financial, political and industrial preeminence in the world economy. Two devastating world wars, into which the British people threw every ounce of their material and human resources, accentuated the trend. Since the National Health Service is an organic part of the social fabric of the country, its future will be determined not by physicians, hospitals and universities but by the economic and financial conditions of a nation whose solvency at this moment is precarious.

Study of Plans of Medical Students for Practice

DR. MYRON M. WEAVER, Vancouver, B. C.: A survey extending over several years which was conducted to determine the plans of medical students at one institution appears to support the following conclusions: Nearly every student wishes to undertake considerable hospital training beyond his internship. The principal limiting factors usually prove to be financial stringency and the unavailability of proper hospital appointments rather than considerations of specialty practice versus general practice. The present day medical student seems fully to appreciate the advantages of clinic or other group practice. In spite of prospects for good hospital facilities in small communities, recent medical graduates and students in the earlier years of the medical course continue to exhibit a decided preference for urban centers as they contemplate entering on their medical practices. Medical students are not favorable, in general, to the idea of compulsory national health insurance.

General Practice and Licensure

DR. A. D. WOODS, State Center, Iowa: Regarding the clamor for more general practitioners two schools of thought prevail. One advocates a long residency preparation for the general practitioner, the other, an intensive but shorter period of training. In the Colorado plan there is a three year residency in general practice. Their philosophy is based on the following fundamental principles:

1. There is a continuing need for well trained general practitioners. 2. The well trained general practitioner furnishes the most economical type of medical service. 3. The well trained general practitioner may adequately handle up to 90 per cent of all medical problems. 4. It is inconceivable that a physician can be trained to do general practice in any less time than it takes to become a specialist.

One can readily agree with the first three principles of their philosophy, but scrutiny of the fourth principle reveals inconsistencies and raise objections. Is it not inconsistent to graduate a student after seven years of intensive training, grant him the M. D. degree and then tell him he is not competent to practice medicine? Does not this cast reflections on the adequacy of undergraduate instruction? As this scheme is now carried out in Colorado, the student spends eleven years before entering practice. Further criticism of this plan is in the fact that all the instruction remains in the hands of the specialist. Many of the problems that the student will be called on to deal with in general practice he will never see in an institution. In fact, no matter how extended the instruction the student may have in medical school or hospital there will be much he will have to do as he learns to practice medicine his way. If no man is competent to practice medicine until he has received eleven years of medical education, then no man should receive a diploma at the end of seven years.

In Iowa at the recent session of the legislature a clamor went up for the training of more physicians by the state university medical school. Further cognizance of the situation was taken when the state medical society appointed a General Practice Committee.

It is our job to pass on the qualifications of the applicant as a general practitioner, a good, everyday physician, not a half-baked specialist. If it became generally known that all examinations for licensure would be based on the general practice concept is it not possible that more young men would enter the general practice of medicine? In this plea for more and better general practitioners there has been no disparagement of the specialists, who have an important place in medicine. But when the emphasis in medical teaching is so overwhelmingly on the side of the specialties that nearly all medical students aspire to become specialists, then we do have the right to criticize.

DISCUSSION

DR. ADAM P. LEIGHTON, Portland, Maine: We are not giving the people the type of medical attention which they have a right to expect. The lessening in numbers in the ranks of general practitioners, the increase in specialism, the refusal of younger men to make night calls and the desire to take weekends off are responsible for the boomerang that has come our way. I agree with Dr. Wood about the prevailing methods of medical education and I am surprised at the solution presented in the so-called Colorado Plan. To go through a good medical school today plus the usual internship surely should equip one for general practice. Should the Colorado Plan prevail, we rightly will have two classes of general practitioners—the diploma class and the residency class—which is akin to the feeling today between graduates with an internship and those who add the three year residency and take the board examinations toward specialism. I fail to see how such an addition to the medical curriculum will entice men into general practice.

The Iowa Plan as outlined is sensible. Eight years in all of college premedical, medical undergraduate and the year of internship as advocated would suffice. We cannot expect the graduate of today to approach general practice with the avidity shown by those of forty years ago. Things have changed. The bulk of today's medical students are from cities. They are used to comforts and bright lights and have a higher degree of financial stability. Few men are expected to take on rural practice, with its twenty-four hour daily demands, when their fellow classmen become specialists with better remuneration and a five day week in more agreeable surroundings. Commercialism has taken over. My answer to this problem is that we should show the student the importance of the field of general practice and the possibilities of group practice in a country district of several towns with a small hospital. There are many places where such a group could practice the best of medicine with financial success. More states should have medical schools. In my city with 100,000 population there are 185 doctors of medicine. I can count about 20 general practitioners who actually play the part. Try to get a doctor in an emer-

gency from Saturday noon until Monday morning! And ask one to make a night call! It cannot be done. We have 280 osteopaths in Maine. When our medical men left for military service the osteopaths poured into Maine and took advantage of the situation. They were actually declared essential for the care of the populace. The osteopaths became active in church, the Grange and fraternal organizations. The laity liked them and there is seldom any attempt to differentiate. Can you imagine a medical man willing to return to competition such as this? Do not make it more difficult for the medical student. Emphasize the importance of general practice. Graduate more physicians, and show them the need for the well trained old-time type of practitioner. The sooner will he come to earth and stop the mad rush toward early specialism!

(To Be Continued)

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various locations, July 21. *Oral.* Philadelphia, April 23-27, Chicago, Oct. 8-11. Sec., Dr. Curtiss B. Hickcox, 745 Fifth Ave., New York 22.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* Washington, April 14-16. Sec., Dr. George M. Lewis, 66th Street, New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* Boston, April 13-15, San Francisco, June 21-23. The oral examinations in the subspecialties will be held at the same time and places. *Written.* Oct. 16. Final date for acceptance of applications is May 1. Asst. Sec., Dr. William A. Werrell, 1 West Main Street, Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* Chicago, June 3. Sec., Dr. W. J. German, 789 Howard Ave., New Haven, Conn.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, INC. *Oral Part II.* Atlantic City, May 21-28. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I.* New York, April 21-22; Atlanta, April 28-29; Indianapolis, April 28-29; Denver, May 5-6. Sec., Dr. Harold A. Sofield, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various Centers, January 1951. Final date for filing applications is July 1, 1950. *Practical.* Boston, May 22-26; Chicago, Oct. 2-6; West Coast, Jan. 1951. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* San Francisco, May. Chicago, October. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PATHOLOGY: Madison, Wis., April 11-12, St. Louis, Nov. 10-11. Sec., Dr. Robert A. Moore, 507 Euclid Ave., St. Louis.

AMERICAN BOARD OF PEDIATRICS: Philadelphia, March 31-April 2; Cincinnati, May 5-7; San Francisco, June 30-July 2. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Oral and Written,* Boston, Aug. 26-27. Final date for filing applications is April 1. Sec., Dr. Robert L. Bennett, 30 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PLASTIC SURGERY: *Oral.* May-June. Sec., Dr. Louis T. Byars, 4647 Pershing Avenue, St. Louis, Mo.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Spring Examination. Sec., Dr. F. J. Braceland, 102-110 Second Ave., S.W., Rochester, Minnesota.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Chicago, week of June 18. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, Oct. 25. Final date for filing applications is July 1. Sec., Dr. J. Stewart Rodman, 225 South 15th Street, Philadelphia.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 27-29. Sec., Dr. D. G. Gill, 519 Dexter Avenue, Montgomery.

ARKANSAS: * *Examination.* Little Rock, June 8-9. Sec., Dr. Joe Verser, Harrisburg. *Eclectic.* Little Rock, June 8-9. Sec., Dr. Clarence H. Young, 1415 Main Street, Little Rock.

CALIFORNIA: *Examination, Written.* San Francisco, June 19-22; Los Angeles, Aug. 21-24; Sacramento, Oct. 16-19. *Examination, Oral and Clinical for Foreign Medical School Graduates.* San Francisco, June 15; Los Angeles, Aug. 20; San Francisco, Nov. 12. *Reciprocity, Oral Examination.* San Francisco, June 17; Los Angeles, Aug. 19; San Francisco, Nov. 11. Sec., Dr. Frederick N. Scatena, 1020 N Street, Sacramento 14.

DELAWARE: *Examination.* Dover, July 11-13. Sec., Dr. J. S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 25-27. Sec. Dr. Frank D. Gray, 12 N. Rosalind Avenue, Orlando.

GEORGIA: *Examination.* Atlanta and Augusta, June. *Endorsement.* Atlanta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

HAWAII: *Examination.* Honolulu, July 10-13. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: Boise, July 10. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

ILLINOIS: Chicago, April 4-6. Superintendent of Registration, Mr. Charles F. Kervin, Capitol Bldg., Springfield.

INDIANA: *Examination.* Indianapolis, June. Sec., Dr. Paul B. Tindall, 1138 K. of P. Bldg., Indianapolis.

IOWA: * *Examination.* Iowa City, June 12-14. Sec., Dr. M. A. Royal, 506 Fleming Building, Des Moines 19.

KANSAS: Kansas City, June 7-8. Sec., Dr. J. F. Hassig, 905 N. 7th Street, Kansas City.

KENTUCKY: *Examination.* Louisville, June 14-16. Sec., Dr. Bruce Underwood, 620 S. 3rd Street, Louisville 2.

MARYLAND: *Examination.* Baltimore, June 20-23. Sec. Dr. Lewis P. Gundry, 1215 Cathedral Street, Baltimore 1, *Homeopathic.* Baltimore, June 20-21. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MISSOURI: *Reciprocity.* St. Louis, March 26. *Examination.* St. Louis, May 31-June 2 and June 7-9. Exec. Sec., Mr. John A. Hailey, Box 4, State Capitol Building, St. Louis.

MONTANA: Helena, April 3-5. Sec., Dr. Otto G. Klein, First National Bank Building, Helena.

NEBRASKA: * *Examination.* Omaha, June 5-7. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Building, Lincoln 9.

NEVADA: Carson City, May 1. Sec., Dr. George H. Ross, 113 Curry Street, Carson City.

NEW JERSEY: *Examination.* Trenton, June 20-23. Sec., Dr. E. S. Hallinger, 28 West State Street, Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. Charles J. McGoey, Coronado Building, Santa Fe.

NORTH CAROLINA: *Endorsement.* Pinehurst, May 1. *Written.* Raleigh, June 19-22. *Endorsement.* Raleigh, June 19. Sec., Dr. Ivan Procter, 226 Hillsboro Street, Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, July 5-7. *Reciprocity.* Grand Forks, July 8. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Reciprocity.* Columbus, April 3. *Examination.* Columbus, June 14-17. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

OKLAHOMA: * *Examination.* Oklahoma City, June 7-8. Sec., Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City.

OREGON: **Endorsement.* Portland, April 28-29. *Written.* Portland, July. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Building, Portland 4.

RHODE ISLAND: * *Examination.* Providence, April 6-7. Chief, Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: *Examination.* Columbia, June 26-29. *Reciprocity.* First Monday of each month. Sec., Dr. N. B. Heyward, 1329 Blanding Street, Columbia.

SOUTH DAKOTA: * Sioux Falls, July 18-19. Sec., Dr. C. E. Sherwood, 300 First National Bank Bldg., Sioux Falls.

TEXAS: * *Examination.* Austin, June 19-21. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: *Examination.* Salt Lake City, June. Dir., Dr. Frank E. Lees, 324 State Capitol Building, Salt Lake City.

VIRGINIA: *Examination.* Richmond, June 23-24. *Endorsement.* Richmond, June 22. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke.

WEST VIRGINIA: Charleston, April 3-5. Sec., Dr. N. H. Dyer, State Capitol, Charleston.

WISCONSIN: * Milwaukee, July 11-13. Sec., Dr. C. A. Dawson, River Falls.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: *Examination.* Tucson, March 31. Sec., Mr. Francis A. Roy, Science Hall, University of Arizona, Tucson.

ARKANSAS: *Examination.* Little Rock, May 9. Sec., Mr. L. E. Gebauer, 1003 Donaghey Building, Little Rock.

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Building, Washington.

FLORIDA: *Examination.* June 3. Sec., Mr. M. W. Emmel, University of Florida, Gainesville.

IOWA: *Examination.* Des Moines, April 11. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

MINNESOTA: *Examination.* Minneapolis, April 4-5. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: *Examination.* Omaha, May 2-3. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

OKLAHOMA: *Examination.* Oklahoma City, April 11. Sec., Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City.

SOUTH DAKOTA: Vermillion, June 2-3. Sec., Dr. Gregg M. Evens, 310 E. 15th Street, Yankton.

TEXAS: *Examination.* Austin, April 21-22. Sec., Brother Raphael Wilson, 306 Nalle Building, Austin.

WISCONSIN: Madison, April 1. Milwaukee, June 3. Sec., Prof. W. H. Barber, Ripon.

National Conference on Rural Health

Fifth Annual Meeting held in Kansas City, Mo., Feb. 3 and 4, 1950

DR. F. S. CROCKETT, Lafayette, Ind., *Chairman*, Presiding

FRIDAY, February 3

MUNICIPAL AUDITORIUM

CHAIRMAN CROCKETT: The Committee on Rural Health of the American Medical Association welcomes you to this conference, which, like the preceding ones, is not set up to prove or promote any preconceived conclusions. We hope to develop new ideas. In previous conferences we have developed most of the facts concerning rural health problems, and the recognition of these facts has been responsible for much improvement.

Our theme today, "Let's Do Something About It," can be summed up in three words—Community Health Councils. One of the most important developments in the mechanics of bringing rural health to the community has been the addition of a health education specialist to the personnel of our Land-Grant extension services. At last count seventeen colleges had added someone for this purpose. This gives us a teacher and leader who can spend full time visiting all the counties in the state and encourage organization and direct the activities of health councils. In the Eleven-Point Plan announced at our conference last year we pointed out that "all elements needed to bring high standards of health to rural communities are now functioning. All that is needed is a good channeling organization with medical guidance." The national and state medical societies are doing everything possible to encourage the local medical profession to extend help and guidance. The community health council, if properly organized with broad interests, wide popular support and wise leadership will supply the channel through which any community can solve its own health problems, in its own way and to its own satisfaction.

Rural Medical Facilities at the Local Level

MR. PAUL C. JOHNSON, Editor, *The Prairie Farmer*, Chicago: Our problem is not one of hospital beds and x-ray equipment but rather a matter of intelligent interest and understanding on the part of rural people. I am deeply concerned about rural health and rural attitudes which are a part of health, because I see the rural population growing smaller and becoming each year a more critical minority in this great industrial nation. At present at least two out of every five boys and girls reared on the farm find their way into the life and work of the urban centers. The birth rate is falling in the better farming sections, and much of the migration from farm to city is off the marginal farm lands and out of the poorer agricultural sections of the country.

It will make a lot of difference to America how the stream of youth is equipped, morally, educationally and physically. Will they bring with them health and energy, self reliance and confidence in their destiny and qualities of leadership that will revitalize our cities and combat some of the diseases of society that breed in industrial centers? Even as precious as health is, it is not a complete end in itself. It makes a lot of difference what one does to earn and share that health. I will call the roll of some rural health resources in which we have been found seriously wanting. Let us start with our lack of understanding, both in professional and urban circles, as well as on the farm, of the farmer's role of custodian of animal health and animal production. Even a layman can name a list of diseases which originate in the country, largely among farm animals, and, after taking a heavy human toll in the country, move on to ravage the cities. We have just begun tackling these health hazards at their source. We must arouse farm people to a feeling of responsibility. There must be community programs for both education and eradication. We must revise our standards of what is adequate veterinary service, and we have to improve cooperation between "horse doctors" and "human doctors." Maybe a community program to tackle this problem will be worth more than a new hospital.

Another rural health facility which we need badly is to improve and speed up our public health programs. That calls for interested citizens and interested doctors who are willing to take time off from practice to lead the community in its public health work. More public health activity, fewer persons in the waiting room on Saturday afternoon. Where does the doctor render his greatest service, meeting with a group of citizens at the city hall to talk about fly control, a school vaccination program, milk ordinances, or pushing a line of patients through the mill as rapidly as possible back in his office? There is no easy answer to that question. All the more reason why we should give it more thought. We need more county health departments, more community nursing services, more school immunization and education, more intelligent administration of public aid programs. We need more doctors, we need more veterinarians, more nurses, more nonpolitical public health officials and inspectors.

But we can get along with fewer doctors and other health personnel if we push education in health and nutrition, not only in the schools but in 4-H work, in home demonstration work under the agricultural extension program and in other ways. We can get along with fewer doctors and fewer hospital beds if we look after our soil, which we have discovered belatedly is also a medical facility.

Everybody knows we need more hospital beds, more properly equipped clinics and doctors' offices. We have made progress in that direction with the Hill-Burton program and many state programs which are working well. But as an editor I remind you that along with the relocation of hospitals and increased specialization in medicine must go a new understanding on the part of the people. Almost every mail brings me an appeal to find a doctor for a community. But investigation reveals often that the community has done nothing to earn such services. The gentle people do not realize that they let their doctor wither on the vine and that they have been taking their important medical work to the county seat or even farther away. We have a lot of homework to do if we are to get our rural health resources into shape.

The prepaid health plans have been making progress in our rural areas. I could mention other things which are important in rural areas. Physical health is at least half mental health. What are we doing to encourage wholesome thinking? Are we encouraging or discouraging the chronic ailments that are largely in the mind and which constitute the worst drag and the most expensive waste in any medical program. What are we doing about the old people? We ought to put them to work to further our health programs, and not look on them as an extra drag on our health facilities.

If we are to strengthen health resources at the local level, the people themselves will have to take the lead. Good health must be earned. If people get into the habit of thinking of health as something which comes to them on a platter, they will dream up all kinds of ailments to keep the doctors busy.

It is not easy to awaken a community, to fight prejudice, to build health organization and to promote health practices. But these community efforts are preventive medicine in its highest form. Unless we attack the causes of bad health at their roots, we will never get enough doctors and nurses.

Relation of Agricultural Extension Service to Rural Health Problems

DR. LEWIS WEBSTER JONES, PH.D., President, University of Arkansas, Fayetteville, Ark.: I congratulate the American Medical Association for this type of leadership in a problem which concerns the welfare of America. I consider this movement one of the most significant in matters of public health in recent history. I would like to talk about the relation of the state universities, particularly the Land-Grant institutions, to rural health problems. A few decades ago most persons believed that rural life is inherently healthy. Our grandfathers thought they were healthy if they were not actually in a state of conscious pain. Today, we are working on the concept of positive health, and that concept is spreading through every stratum of our society. If we are to work toward it we must have a concerted educational approach. We must educate the doctors, the dentists and the other health workers we need; we must provide for

medical research, we must teach people how to take care of their own health in accordance with sound hygienic principles and how to make better use of community resources. We not only must have adequate hospital facilities within the reach of all—we must keep them adequately staffed with well trained doctors, nurses and technicians. To attain those objectives, we must get down to the grass roots of our society with an understanding sense of community responsibility and community leadership.

Children are the most valuable "crop" we are raising on our farms. Yet it is easier to organize people to combat the diseases of cotton or to admire prime cattle or hogs than to give organized community thought to the well-being of farm children.

Our universities have an inescapable responsibility in this. The Land-Grant institutions in particular were founded to serve the peoples of their states by making useful knowledge available for the improvements of everyday life. I regard the Land-Grant college system as the one great American invention in the field of education, expressing as it does the most inspiring and practical aspects of the democratic ideal. Learning was no longer to be the privilege of the fortunate few. It was to be brought into the field, the factory, the home and the market-place. It was to equip ordinary people to raise their own standards, to live better, more productive and healthier lives. Nearly 90 years have passed since the Land-Grant system was established. We point with pride to the many accomplishments which have come from the campuses of these institutions. But let us face this fact: We have not done the job we should have done in matters of public health.

Starting at the point farthest removed from the farmer's water supply or his baby's measles, the university has a responsibility for the support of medical research. Medical science is highly complex and cooperative, requiring the constant interchange of experience and information between laboratory and clinic, the scientist and the practitioner. Increasingly, sound health organization requires also the cooperation of nonmedical research, especially in the related fields of psychology, sociology and economics. The universities must be ready to offer their services in all these matters and to undertake special research projects to meet particular problems as they arise.

Moving closer to the everyday living of the farmer the universities must disseminate knowledge by training competent medical personnel and even the farmer and his family. We must stop thinking merely in terms of a school of medicine as the answer to our responsibility in matters of health and medical education. We must start thinking in terms of medical centers in which medical education, research and clinical facilities can be coordinated and integrated. We must provide internships and postgraduate training. The University of Arkansas, working in close cooperation with the State Hospital for Nervous Diseases, is engaged in the development of a state medical center designed to achieve these ends in medical education, research and hospitalization. Yet the achievements toward which we are working will go unrealized without a sound and effective program of health education at the grass-roots level. In fact, our people are not taking full advantage of the facilities already at hand.

For years our School of Medicine has conducted free clinics for the clinical instruction of our medical students. Patients by the thousands go through these clinics, but vast numbers of them delay their visits until the disease is so far advanced that recovery is impossible.

It is lamentable that, after the state has performed the costly task of educating medical personnel, far too many of them gravitate to the urban centers. Education of medical personnel alone cannot solve this problem. The grass roots of society must become sensitive to the underlying factors involved. The problem that cannot be solved by superficial remedial measures. The basic causes of the now existing isolation of rural medical practice must be corrected. If they are corrected, if rural practice is made attractive to the young doctors and dentists, they will return to the rural areas. What can be done to close the gap between knowledge and practice, as far as the farmer is concerned? Many rural people do not know enough about personal and farm hygiene. Still more have no conception of a good standard of medical care. Medical care too often means to them the ability to purchase remedies, many of which are a waste of money if not harmful. Or it may mean a resort to the quacks who promise quick cures.

The Agricultural Extension Service has a job of education to perform in matters of rural health. If we assume that we have provided, at one end of the scale, for the training of adequate medical personnel and for adequate medical research, and at the other end an informed public opinion concerning health, we still have two hurdles to overcome in closing the gap between medical technology and its application to rural health.

One is, how are we to coordinate the services effectively? That is a pioneering problem in technical organization. The other is, how are we going to pay for it? That is a pioneering problem in economic organization. These two problems require a great deal of intensive public education. The responsibility for rural health can no longer be left to the doctors alone, nor to public health departments. It requires grass-roots understanding and community cooperation on a scale to which we have not been accustomed.

Health is, to a great extent, a purchasable commodity. Low cash income and scattered populations present difficulties to most of the schemes for prepayment or voluntary insurance, schemes which are now meeting, in part, the needs of urban groups and factory workers. It is necessary to make available to farm populations all reliable information about the various methods of payment which are now under consideration. It is not the business of the extension workers to advocate any one of these schemes, some of which are highly controversial, but it is the responsibility of the Extension Service to provide information, to stimulate discussion and to cooperate with medical and lay groups in working out practical solutions. These solutions will be sound if based on informed local support and local initiative and adapted to local conditions, but weak if cooperation among medical societies, public health departments, federal agencies and community organizations is lacking.

I have assigned to the Extension Service a task which cannot be fulfilled tomorrow or next week. We need more extension specialists in public health, more training in matters of health for county agents and home demonstration agents in general. We need a greater sensitivity to the rural health problem and a determination on the part of all concerned—the university administration, the research specialist, the teachers, the students, the extension workers and the farmer himself—to do something about it. There must be a coordinated attack, on the national, the regional, the state and the local levels.

Community Responsibility for Health Service in Rural Areas

MR. JOHN BRANDT, President, The National Milk Producers Federation, Minneapolis: Rural health and the ways and means of improving health conditions in rural communities have always lagged behind that which has existed in urban centers. However, this situation has materially changed especially in the last fifteen years. Many small towns that were without doctors, dentists and nurses now have one or more associated with the medical profession in their midst, which has brought able medical experience and assistance right out into our rural communities. Now many of these small towns have modern hospitals, medical clinics and full time medical service. There is a great movement on foot which is enthusiastically supported by farm organizations, the citizens of our smaller towns, county and city officials, in the building and modernization of hospital and health service. In Minnesota and bordering states there are now many farm organizations which have spearheaded the health and safety programs to the extent that they are participants in educational insurance and health-protective associations, which have automatically developed leadership and extended interest to the vast membership of these organizations. There is hardly a place now even in the most remote rural areas in which the modern opportunity for better health is not available. As I see it in our area, rural Minnesota has done much in the way of promoting rural health and, through well organized safety councils, has developed safety programs and transmitted these programs to rural communities in an effective manner. We still lack some facilities in rural education and understanding of the opportunities available to rural communi-

ties. We are still in need of some additional rural hospitals which, in themselves, will attract better medical service to rural communities, but this program is developing rapidly.

Education, transportation, communication, rural electrification, health and hospital service and safety council work have combined to bring to rural communities in our area the opportunities available in cities. What we need most is further education and understanding on the part of rural people of the services available to them and of the importance from a health standpoint of observing the principles that apply to the maintenance and improvement of health and accident provision in rural communities.

A strong movement is being fostered by the extension departments of our universities in connection with the 4-H Clubs, Rural Youth, Future Farmers and other youth organizations, that is, building a firm foundation in recognition of the importance of rural health. The youth participation in this work is possibly the most important aspect of the entire advancement in rural health.

It is just as much the business of the individual to consider his health as part of his responsibility as is the job of running his farm, and any governmental, paternalistic course that we follow to the end that it becomes entirely a governmental responsibility is an important step in leading us down the road away from the free enterprise system.

I do not believe we can improve on the progress and development we have made in this nation in the advancement of health and the method we have available through private enterprise in prepayment insurance as a financial protection when catastrophe strikes.

Our farm organizations are equipped to render educational and promotional services in rural health. I am sure that by far the major portion of the leadership and membership of these farm associations considers the advent of socialized medicine as a dangerous philosophy and one that will not in any way improve on the self help system that we have at present.

Methods of Prepayment for Health Services in Rural Areas

DR. J. P. SANDERS, Vice President, American Academy of General Practice, Shreveport, La.: Prepaid medical and surgical insurance was first tried out by one of the northern railroads in about 1876. As a health and accident type of insurance it was limited in scope; it did not include the employee's family, and the whole principle developed slowly. Surgical and medical insurance got its impetus after about 1930 during the depression. Many persons found they could not pay large medical and hospital bills. The growth of Blue Cross illustrates how the American people, when they realized they had a need, went ahead in their own way to work it out. About four years ago, the Associated Medical Care Plans (AMCP) was organized. The purposes of the organization were largely to coordinate the efforts of the different plans and to transfer information and experience from one group to another.

BLUE CROSS AND BLUE SHIELD COMBINED

There was such close relationship between hospital care and medical care that an amalgamation of Blue Cross and Blue Shield was inevitable. The two policies could be sold in combination, the bills could be rendered together and the payments could come from the same central source. This cut down the overhead and shortened the time between the patient's illness and payment to the doctor and hospital.

Blue Cross and Blue Shield have gradually been offered to other groups, including the unemployed and their families. Last September the Louisiana Physicians Service opened up a campaign for membership for two weeks. Everyone was given an opportunity to enrol at that time. Our enrolment almost doubled during that period, and the commercial companies, even though they made no attempt to work with us, found a large increase in their business. They plan next year to make a concerted campaign with our organization. Similar campaigns have been put on by other state groups with similar experiences.

THE DEDUCTIBLE POLICY

One big objection to compulsory national health insurance is that any patient can go to any doctor at any time and have the government pay the bills. Neither Blue Cross and Blue Shield nor any commercial company can give that complete coverage without a prohibitive premium rate. There would be no way to control the number of doctors that a patient could visit, the amount of laboratory and x-ray work that would be done, the number of prescriptions that would be written and other items that increase medical care. However, if some company would write a policy covering all medical expense above a certain specified amount, then that patient would be taken care of with any type of catastrophic illness and would not be bankrupted. Some commercial companies and AMCP are working on that principle at present. Only 10 per cent of the population is sick in any one year. Only 10 per cent of this, or 1 per cent, has a serious illness. But only 10 per cent of this 1 per cent, or 0.1 per cent have an illness that is of catastrophic proportions. This 0.1 per cent of the population is the group we are trying to save. It seems fantastic that we should go all out for a medical care program that has failed everywhere it has ever been tried, in order to protect this 0.1 per cent.

Since the average cost of medical care per family over the nation is $55 per year, the farmer should plan for his medical care in his budget for the year. It is now possible for farmers to buy in groups, Blue Cross and Blue Shield policies. However, if these do not meet his requirements, then there are many commercial policies that will meet his needs.

The Responsibility of the Medical Schools in the Rural Health Program

DR. FRANKLIN D. MURPHY, Dean, University of Kansas School of Medicine, Kansas City, Kan.: In most parts of our country life expectancy and maternal and child mortality are all showing remarkable and steady improvement. Therefore, in no sense are we confronted with a crisis but simply with the problem of modifying existing patterns to guarantee steady and in some instances more rapid improvement of health conditions. The schools of medicine have pressing and important obligations in this whole structure. There are those who feel that there are shortages of doctors, nurses and many types of technicians. If such is the case, only the medical schools can correct this situation, but in doing so they must protect established standards of medical education. Some, either through ignorance or intellectual dishonesty, state that the medical profession uses standards of medical education to hold down the number of medical graduates for the economic benefit of the practicing profession. How stupid their folly! Standards of medical education have been devised by the medical profession and the medical colleges for the protection not of the profession but of the consuming medical public. The consumer of medical care has a greater stake in standards of medical education than does the doctor himself.

Increased production of doctors, nurses and supporting technical personnel without compromising standards of training can in the long run be accomplished only by expansion of the training areas, i. e., the medical schools and the staff and faculty operating therein. These obligations fall on the medical schools at a time when they are in the main functioning at full capacity and in financial difficulties because of increased costs and reduced endowment income. Increased financial aid must be forthcoming if the schools of medicine are to maintain the high quality which they have struggled to achieve.

Teachers too frequently tend to build a teaching program which reflects academic excellence but which is somewhat out of touch with the realities for which the students in this curriculum are being prepared. Unfortunately, doctors and laymen alike often expect too much of the medical school. Medical schools exist primarily to teach scientific principles to young men and women. It is no longer possible for any medical school to turn out a "compleat" and polished physician at the end of four years. There are refinements and modifications of the basic medical school curriculum which can be accomplished in order to realistically train a young man for a country practice without in any sense compromising the quality of his basic medical course. The pressures of modern medical practice are so great that, if postgraduate education is to be available, it must be prepared in an organized way for the practitioner by the school of medicine. These postgraduate programs must recognize that the general practitioner is the backbone of medical practice. A continuing moderate production of specialists

is desirable, but expansion of production of men in general practice is essential, and the same principle applies in the planning of postgraduate programs. As one looks about the country, he sees an increased activity on the part of schools of medicine to set up such programs, and this development can lead only to better and better medical care. Furthermore, as these programs expand to include circuit type courses, where the faculty goes out to the doctor, as it were, the young man can go into medical practice in rural communities without any sense of becoming medically isolated.

Too often medical schools conclude that their obligations cease with the training of professional personnel and the prosecution of research. The medical school has great responsibilities in terms of leadership and assistance in planning health programs as well as the development of close relations with communities in the area served by the school of medicine, so that these communities may be guided in their efforts to resolve their medical problems. In our state we have tried to explain the many technical problems concerned with the shortage and maldistribution of physicians and we have tried to encourage local community leadership to meet the challenge in a constructive, objective way. We have met with moderate success, which leads me to believe that such could be the case in any of our forty-eight states. We in the medical school have looked with pleasure at the small hospitals now springing into being in central and western Kansas, some under the Hill-Burton act with partial local financing, others completely financed locally. We have striven for a close working arrangement with the State Board of Health, the Kansas Medical Society and various consumer medical groups, realizing that to properly expand and modify a plan of medical care for 2,000,000 persons requires the greatest integrated and cooperative effort. Elsewhere in this country efforts of a different type, but with just as much potential significance for the consumers of medical care, are going forward, but wherever a successful development is found one also finds certain basic ingredients, namely, an interested, enlightened people, a progressive group of practicing physicians, cooperative and helpful government agencies and a visionary and nontraditional medical school leadership. The absence of any one of these ingredients will surely mean difficult and often insuperable obstacles. The presence of all will guarantee that we in America can provide our rural citizenry the finest type of medical care available under any plan without disruption of a system of medical care which has more than justified its existence.

(To Be Continued)

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Abscess Following Injection for Hemorrhoids.—This was an action for damages alleged to have resulted from the malpractice of the defendant physician. From a judgment in favor of the plaintiff, the defendant appealed to the Supreme Court of Wisconsin.

The plaintiff was suffering from hemorrhoids, and, after consulting his own physician who recommended surgery, he went to the office of the defendant, who held himself out as a nonsurgical practitioner. An assistant of the defendant gave the plaintiff a rectal hypodermic injection and the following day defendant himself gave the plaintiff a similar injection, at which time he found evidence of the start of an ulcer. Two days later the plaintiff, in severe pain, returned to the defendant, who found a well advanced ulcer, advised the plaintiff that the abscess would have to be opened and suggested that he should return for the defendant's usually administered treatment for hemorrhoids when the abscess had been cleared up. The plaintiff then went to his family physician, who hospitalized him and subsequently performed an operation which included removal of the hemorrhoid.

It was the plaintiff's contention that the defendant's act of injecting into the inflamed area caused a spread of the infection and the subsequent formation of the abscess. The defendant contended, however, that the abscess could have originated from a variety of causes.

One of the plaintiff's experts testified that if an infection is present an injection will cause it to spread, and it could reasonably be assumed that the injection administered to the plaintiff caused a breakdown of tissue, consequent spread of the infection downward and the formation of the abscess. In the opinion of the plaintiff's physician, the abscess was caused by the injection. The defendant and an expert who testified in his behalf said that the treatment conformed to medical standards and did not cause the abscess.

The plaintiff's evidence appears to us, said the Supreme Court, to provide that preponderance of the probabilities in identifying the proximate cause which this court has held to be sufficient. We think that, while there was a possibility that the inflammation the plaintiff had might have developed into an abscess, it is far more probable that the abscess was caused by the injection which introduced bacteria below the inflamed area. The jury's finding was based on competent, credible evidence and not on guess or conjecture.

The defendant contended further that he was not legally responsible for the treatment given by his assistant; but, answered the court, the defendant completely acknowledged the acts of his assistant to be his own, which is a very good recognition of responsibility under the doctrine of respondeat superior. The judgment in favor of the plaintiff was accordingly affirmed. —*Heimlich v. Harvey, 39 N. W. (2d) 394 (Wis., 1949).*

Drunkenness: Admissibility of Chemical Tests for Intoxication.—The defendant was found guilty of driving a motor vehicle while under the influence of intoxicating liquor, and he appealed to the court of appeals of Ohio, Franklin County.

The evidence disclosed that the defendant, when arrested, did not know the time of day, his breath smelled of alcohol and he swayed when he walked. When at the city prison, about two hours after his arrest, and at a time when the arresting officer was of the opinion that he was not intoxicated, he was asked whether he wanted to submit to a urinalysis. He twice replied that he did, that he wanted to do anything which would prove that he was not intoxicated. A chemist-biologist, with the city police department, who established his qualifications as an expert on the subject, testified that the sample of urine taken from the defendant "disclosed a percentage of alcohol which in his judgment established that the defendant was definitely under the influence of alcohol at the time he was arrested."

One question of substance is presented on appeal, said the court, and that is whether or not defendant's constitutional right has been infringed. The relevant section of the Ohio State Constitution provides: "No person shall be compelled in any criminal case, to be a witness against himself."

Many cases hold that the protection accorded to a defendant is against testimonial compulsion only, said the court. We will not pursue this question but assume further that protection extends a privilege to the defendant against the admission of evidence gained by physical examination or tests made on the defendant's body. There is unanimity of adjudication that the element of compulsion must appear before a defendant may claim the protection of the self-incriminating clause of the Constitution. Here, it is manifest that the defendant willingly submitted to the taking of his urine for the purpose of a test to determine whether or not he was intoxicated. Quoting from the decision of the Supreme Court of Oregon in *State v. Cram, 160 P. (2d) 283,* the Ohio court of appeals said: "It is well settled that the constitutional provision forbidding compulsory self incrimination is not violated by a voluntary physical examination of a defendant in a criminal case and that testimony based on a voluntary examination is not excluded by such provision." Cases from thirteen states were cited to support this proposition and none to the contrary.

The judgment of conviction was accordingly affirmed.—*City of Columbus v. Thompson, 89 N. E. (2d) 604 (Ohio, 1949).*

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Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodical are available from 1939 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

218:483-602 (Nov.) 1949

Blood Temperature and Its Control. H. C. Bazett.—p. 483.
*Exophthalmic Goiter in Children: Treatment with Propylthiouracil. A. S. Jackson and H. B. Haley.—p. 493.
Liver and Kidney Function in Rocky Mountain Spotted Fever. W. A. Wolff and G. T. Harrell.—p. 500.
Embolization with Material from Atheromata. F. G. Zak and K. Elias. —p. 510.
Occurrence of Chronic Cyanosis in Cases of Atrial Septal Defect. A. Selzer and A. E. Lewis.—p. 516.
Study of 22 Cases of Carrion's Disease with Intercurrent Malaria. W. E. Ricketts.—p. 525.
*Metabolic Study of Gynecomastia Associated with Liver Disease. E. L. Coodley and W. E. Molle.—p. 531.
Liver Function in Diabetes Mellitus. H. Brown.—p. 540.
Influence of Physical Therapy Procedures on Intra-Articular Temperature of Normal and Arthritic Subjects. J. L. Hollander and S. M. Horvath. —p. 543.
Metabolism of Thiocyanate After Prolonged Administration in Man. F. C. Moister and E. D. Freis.—p. 549.
Diazomethane Poisoning: Report of Fatal Case with Autopsy. E. B. LeWinn.—p. 556.
Diagnostic Significance of "Burr" Red Blood Cells. S. O. Schwartz and S. A. Motto.—p. 563.

Propylthiouracil in Exophthalmic Goiter in Children.—Jackson and Haley discuss observations on 26 children, 16 years of age or younger, with hyperthyroidism. Depression of white blood cells must be carefully watched for during the use of thiouracil and propylthiouracil. Propylthiouracil is much safer than thiouracil, which should no longer be used. These drugs have a goitrogenic action, as evidenced in 2 patients in whom the toxicity was relieved, but in whom the large size of the gland made thyroidectomy necessary. Individual response to these drugs in children is uncertain. They are probably most useful in preparation for surgical treatment or in patients in whom it may be necessary to delay the operation. The fact that the disease was permanently arrested by propylthiouracil in only 1 patient indicates that operation is still the method of choice. Iodine should be given to all patients prior to and following the operation. Its use is especially indicated following propylthiouracil therapy to decrease the vascularity of the gland and reduce bleeding at operation. Cervical nerve block anesthesia was successfully used in all patients requiring thyroidectomy. Children must have an even more careful post-operative regimen than adults. A high caloric diet, restricted activity, rest and administration of iodine are helpful.

Gynecomastia Associated with Liver Disease.—Coodley and Molle state that the relation of estrogen metabolism and liver disease to gynecomastia has been emphasized because the liver is the principal organ for inactivation and conjugation of estrogens. They report a patient with a long history of alcoholism with dietary deficiencies in calories, vitamins and proteins. The patient, a man aged 30, had a unilateral enlargement of the left breast, gradual loss of pubic, chest and axillary hair, sexual impotence and loss of libido. The liver edge was palpable below the costal margin. Liver biopsy revealed portal cirrhosis with fatty changes of the liver cells. After endocrine studies and the counting of nevi aranei (spider angiomas), the patient was treated with estrone in oil for two weeks. Liver function tests and liver biopsy at the termination of the treatment with estrone showed improvement and a decrease in the number of angiomas. The patient was then placed on a high protein, high carbohydrate and low fat diet with protein supplements. He also received a vitamin B complex intramuscularly each day. Crude liver extract, 2 cc., was administered 3 times daily. There was a progressive improvement. Administration of estrogens was apparently not toxic to the damaged liver since improvement occurred during and after the estrogen administration. The changes in breast size were somewhat correlated with estrogen titers but lagged behind the rate of hepatic improvement. It is difficult to explain the unilateral gynecomastia except by assuming a different degree of sensitivity to circulating estrogens in the two breasts. The increase in urinary ketosteroids, increase in libido and increase in the size of the right testicle indicate a close correlation between liver function, adrenal function and gonadal activity.

Archives of Ophthalmology, Chicago

42:515-684 (Nov.) 1949

*Therapeutic Action of Streptomycin and Promizole® in Clinical Ocular Tuberculosis: Preliminary Report. A. C. Woods.—p. 521.
Fundamental Concepts in Glaucoma. S. Duke-Elder.—p. 538.
Sarcoidosis Involving the Orbit: Report of 2 Cases. W. L. Benedict. —p. 546.
Investigation of Visual Space. L. H. Hardy.—p. 551.
Subchoroidal Expulsive Hemorrhage Occurring During Thiopental Sodium (Sodium Pentothal®) Anesthesia: Its Treatment by Sclerotomy. D. Vail.—p. 562.
Intracapsular Extraction of Cataracta Complicata Accreta After Iridocyclitis and Glaucoma. A. Pillat.—p. 567.
Experimental Studies on the Vitreous: I. Experiments on Diffusion in Vitreous and on Permeability of Its Surface Condensation Layer. L. von Sallmann.—p. 583.
*Cataract Formation in Human Embryo After Rubella. F. C. Cordes. —p. 596.
Cyclodialysis. C. S. O'Brien and J. Weih.—p. 606.
Detachment of Retina in Early Sarcoma (Malignant Melanoma) of Choroid. B. Samuels.—p. 620.
Use of Hyaluronidase with Local Anesthesia in Ophthalmology: Preliminary Report. W. S. Atkinson.—p. 628.
*Shortening of Eyeball for Detached Retina. K. Lindner.—p. 634.
Bilateral Total Ophthalmoplegia with Adenoma of Pituitary Gland: Report of Two Cases: Anatomic Study. F. B. Walsh.—p. 646.
Acute Trachoma. P. Thygeson.—p. 655.
Endogenous Intraocular Fungous Infection: Report of Case. D. G. Cogan.—p. 666.

Streptomycin in Ocular Tuberculosis.—Woods reports on the use of streptomycin and promizole® (4,2'-diaminophenyl-5'-thiazolsulfone) in 14 patients with ocular tuberculosis. Administration of streptomycin, 0.5 Gm. twice daily, combined with promizole®, 6 Gm. daily in divided doses had a dramatic effect in controlling the activity and the inflammation in the 14 patients so treated. The therapeutic response was observed after nine to twenty-one days of treatment. The response thereafter was slow but steady. Irreversible changes, such as corneal scarring, cataracts, vitreous opacities and organic tissue damage, were not influenced by the treatment. Reversible lesions, such as corneal infiltrates, nodules in the iris, choroidal exudates and all inflammatory changes, regressed. Toxic symptoms appeared in a large percentage of patients, but they were not serious and promptly disappeared without residua when the drugs were discontinued. A therapeutic response was manifest before the appearance of any toxic manifestation.

Cataract Formation in the Human Embryo After Rubella.—Cordes states that substantiation of the belief that changes occur in the lens of the embryo during the first trimester, if the mother has rubella, is limited, since the number of embryos obtained for study from women having rubella during the first trimester is small. He describes microscopic studies on the eyes of 4 embryos. The first pair of eyes examined were from an 11 week old embryo whose mother had contracted rubella during the latter part of the second month of pregnancy. Both eyes showed cataract formation. The eyes of 3 other embryos, also from mothers who had had rubella during the first trimester of pregnancy, showed no cataract formation. From a review of the literature and his own observations, the author concludes that cataract formation is seen in a definite percentage of, but not in all, the offspring of mothers who have had rubella.

Shortening of Eyeball for Detached Retina.—Lindner began to use shortening of the eyeball for retinal detachment in 1931, and he published a description of the technic in 1933. Pischel published a report on this operation in the United

States in 1939. This operation is suitable for the following types of retinal detachment: (1) aphakic eyes without detectable holes (in such cases the vitreous is detached far forward); (2) aphakic eyes in which operation had been performed for retinal holes without success; (3) detachment with the retina fixed by strands in such a way that for mechanical reasons a reattachment is not possible, and (4) detachment, operated on several times, in which there is no hope of improving the condition by further surgical treatment of the same kind. The operation was performed on 36 patients. At the time these patients were discharged from the clinic 6 eyes were cured, 10 were improved, 9 were unchanged and 11 were worse. Twenty eyes have been shortened once; twelve have been shortened twice, and four have been shortened three times. Because of the war, only a part of the patients could be reexamined two or three years later. Four of the 6 patients who had been cured were reexamined and had remained cured; the others did not return or answer letters. Two other patients, not cured previously, returned with reattached retinas. The majority of the patients who were not cured and who could be reexamined had become worse. Two patients with but one eye, who had left the clinic with a small area of detachment and with fairly good vision, returned with a total detachment. Patients not completely cured should remain under observation for years, as initial improvement may be lost. The author feels that, if the upper part of the retina remains attached, the preservation of the lower field and the prevention of complicated cataract or of other unfavorable sequelae would qualify even a single operation as serving its purpose. The author stresses that all these eyes were considered lost and would have become worse. One year is required for the estimation of the final functional result. The shortening of the globe is a difficult and a tiring operation.

Archives of Surgery, Chicago

59:1191-1382 (Dec.) 1949

*Effect of Vagotomy on Gastric Secretion in Man and Experimental Animals. h. R. Woodward, P. V. Harper Jr., E. B. Tovee and L. R. Dragstedt.—p. 1191.
*Side Effects and Complications of Sympathectomy for Hypertension. E. F. Fowler and G. de Takats.—p. 1213.
Lumbar Sympathectomy for Arteriosclerotic Gangrene. L. Gerber, W. S. McCune and W. Eastman.—p. 1234.
Surgical Considerations in Hemorrhage of Upper Part of Gastrointestinal Tract. W. E. Sullens, F. Steigmann and K. A. Meyer.—p. 1244.
Resection of Intervertebral Disk Through Posterior Approach. S. L. Haas.—p. 1261.
Giant Nevus of the Back Treated by Complete Excision and Skin Grafting. C. A. R. Schulenburg.—p. 1265.
Role of Transverse Abdominal Incision and Early Ambulation in Reduction of Postoperative Complications. J. B. Thompson, K. F. MacLean and F. A. Coller.—p. 1267.
Management of Cancer of Lower Part of Bowel. H. E. Bacon and R. J. Rowe.—p. 1278.
Carcinoma of Colon and Rectum: Ten Year Study. J. H. Garlock and S. H. Klein.—p. 1289.
Pancreatic Cyst. J. V. Scott.—p. 1304.
Necrosis of Liver Produced by Combination of Experimental Hyperthyroidism and Inflammation. W. C. Sealy and C. K. Lyons.—p. 1319.
Repair of Anterior Subcostosternal Hernia of Diaphragm (Hernia of Morgagni) Using Flap of Transversalis Fascia. G. S. Parrella and A. Horwitz.—p. 1327.
Progress in Orthopedic Surgery for 1946: XX. Conditions Involving Spine and Thorax, Exclusive of Those in Lower Part of Back. J. R. Cobb.—p. 1335.
Id.: XXI. Research. A. R. Shands Jr. and S. W. Cascella.—p. 1346.
Id.: XXII. Fracture Deformities. C. G. Barber.—p. 1362.

Effect of Vagotomy on Gastric Secretion.—Woodward and co-workers found that a continuous secretion of gastric juice occurs in normal persons when the upper part of the alimentary tract is empty of food and the subject is asleep or is shielded from the sight, smell or taste of food. Under these conditions an average of 18 milliequivalents of hydrochloric acid is secreted during a twelve hour period at night. Under the same conditions 135 patients with duodenal ulcers secreted an average of 60 milliequivalents of hydrochloric acid, almost four times as much as the normal level. A complete vagotomy reduces the output of hydrochloric acid in patients with duodenal ulcer to an amount below the normal level, indicating that the hypersecretion in these patients is neurogenic in origin and that the continuous secretion in normal persons is partly due to a secretory tonus in the vagus nerves. Determination of the hydrochloric acid secreted by the empty stomach of patients with ulcer is the most important index of the secretory abnormality in these patients and is the best guide in evaluation of the completeness of vagotomy. An increase in gastric secretion in response to insulin hypoglycemia constitutes evidence that functional secretory fibers to the stomach are present. Occasionally there is failure to secure a response in normal persons and not infrequently in the immediate postoperative period even when vagotomy has been incomplete. Repeated tests at subsequent periods elicit positive responses in these persons. Repeated negative secretory response to insulin hypoglycemia is evidence that vagotomy has been complete, and a reduction in acid output greater than 60 per cent is usually found. In dogs with vagally innervated totally isolated stomachs, complete vagotomy reduces the output of hydrochloric acid by an average of 76 per cent. Since the nervous and intestinal phases of gastric secretion alone are operative in these animals, it is evident that the nervous phase is more important than the intestinal phase in the ratio of 3 to 1.

Complications of Sympathectomy for Hypertension.—Fowler and de Takats say that the undesirable side effects of sympathectomy for hypertension are due to postural hypotension, compensatory accentuation of vasomotor tonus of the nondenervated portions of the body and alterations of sensory and motor innervation of the visceral organs. These may be expected to some degree in all cases. The selection of cases of hypertension suitable for denervation is still so poorly understood that prediction of operative results in all cases is impossible. The contraindications to surgical treatment depend on the degree of cerebral, cardiac and renal damage already sustained by the patient, as well as on the condition of the peripheral vessels as demonstrated by the lability of the blood pressure to vasomotor tests. Organic and physiologic changes in the cardiovascular, renal and cerebral systems will result in complications in a definite percentage of patients subjected to sympathectomy. Proper selection of cases will diminish the anticipated incidence, which in the experience of the authors amounted to 7 per cent. Severe, prolonged and intractable myalgia and neuralgia occurred postoperatively in 13 per cent of their cases, despite extreme care, and were the major cause of complaint on the part of the patients. Hydrothorax, hemothorax, pneumothorax and atelectasis were encountered in 23 per cent of their cases but were rarely serious. The postoperative morbidity rate of sympathectomy for hypertension was below 10 per cent and the mortality rate below 1 per cent. The benefits of sympathectomy must be weighed against the inherent disadvantages, possible complications and uncertain results.

Bulletin of Johns Hopkins Hospital, Baltimore

85:327-408 (Nov.) 1949

Evidence for Presence of Ribonucleic Acid in Cytoplasmic Bodies that Appear in Hepatic and Adrenal Epithelial Cells of Man in Acute Infection. A. R. Kich and M. Bertarong.—p. 327.
Electrocorticography. C. Marshall and A. E. Walker.—p. 344.
Studies on Chemical Differentiation of Developing Cartilage and Bone: I. General Method. Alkaline Phosphatase Activity. R. H. Follis Jr.—p. 360.
Creatinuria in Man: Roles of Renal Tubule and Muscle Mass. K. L. Zierler, B. P. Folk, J. W. Magladery and J. L. Lilienthal Jr.—p. 370.
*Preliminary Observations on Effect of Adrenocorticotropic Hormone (ACTH) in Allergic Diseases. J. E. Bordley, R. A. Carey, A. McG. Harvey and others.—p. 396.

Adrenocorticotropic Hormone in Allergic Disease.—Bordley and his associates administered pituitary adrenocorticotropic hormone (ACTH) to 5 patients with asthma. In 2 patients the asthma was thought to be caused by combined external and intrinsic factors; in the other 3 it was of the intrinsic type. The sputum of all contained many eosinophils. No more than partial and exceedingly temporary relief was obtained by the administration of epinephrine, aminophylline and ether by rectum. The initial daily dose of ACTH varied between 30 and 100 mg. given intramuscularly and divided into equal portions at six hour intervals. Benefit was noted in four to forty-eight hours. Complete freedom from asthmatic symptoms occurred within one to eight days. Treatment was maintained for eleven to twenty-one days. The daily dose was gradually reduced after the clinical recovery. The total amount administered ranged

from 360 to 775 mg. One patient remained asymptomatic for one month after the therapy was stopped. Clinical studies suggest that ACTH may have an important action in blocking various hypersensitivity reactions.

Bulletin of U. S. Army Med. Dept., Washington, D. C.

9:871-960 (Nov.) 1949. Partial Index

New Endemic Area of Scrub Typhus in Japan. A. H. Thompson. —p. 871.
Civil Defense Planning. W. L. Wilson.—p. 880.
Pearl Harbor and Civil Defense. R. B. Faus.—p. 890.
Diabetes Mellitus: Presently Recognized Concepts of Management. C. R. Hines.—p. 912.
Congenital Nonprogressive Night Blindness. W. C. Caccamise.—p. 920.
Scleroderma with Apparent Gastric Involvement. A. W. Thompson and R. A. Muilenburg.—p. 929.

Canadian Medical Association Journal, Montreal

61:447-552 (Nov.) 1949

*Boric Acid as Poison: Report of Six Accidental Deaths in Infants. E. G. Young, R. P. Smith and O. C. MacIntosh.—p. 447.
New Dietary Standard for Canada, 1949. L. B. Pett.—p. 451.
Cervical Disk Syndrome. E. S. James and P. H. Decter.—p. 456.
Findings in Wartime Physical Examination of Volunteers for Air Force Service, and Some Implications for Future. A. H. Sellers, A. A. G. Corbet, J. B. Hardie and G. D. Manderson.—p. 462.
Treatment of Acute Uraemia Due to Oliguria and Anuria. B. Shallard.—p. 468.
If an Atomic Bomb Should Fall. W. E. Park.—p. 473.
Familial Multiple Polypoid Disease of Colon. D. K. Murray and R. P. Smith.—p. 478.
Some Biochemical Studies of Hepatitis with Special Reference to Problem of Differentiating Medical and Surgical Jaundice. C. J. Watson.—p. 483.
Insanity as Legal Defence. J. C. McRuer.—p. 489.
Patent Ductus Arteriosus. V. O. Hertzman and G. F. Strong.—p. 495.
Tularaemia—Epidemiological Review. C. G. Rand.—p. 501.
Mesenteric Tumours. K. J. Bristow and E. L. Brown.—p. 505.
Ureteral Ectopia. H. R. Elliott.—p. 508.
Acute Thiamine Deficiency: Useful Diagnostic Aid for Its Detection. R. M. Taylor and E. W. McHenry.—p. 512.
Blood Pyruvate Curves of Normal and Obese Subjects Following Ingestion of Carbohydrate. R. M. Taylor and E. W. McHenry.—p. 518.
Haemorrhagic Manifestations Secondary to Dicoumarol. H. A. Cave. —p. 520.
Oesophagogastric Resections. M. Kaufmann and P. Niloff.—p. 523.

Boric Acid Poisoning.—Young and co-workers report 6 infants, aged 6 to 11 days, whose deaths were caused by one feeding of milk which had been diluted with a 2.5 per cent aqueous solution of boric acid. The solution was mistaken for sterile water. The deaths occurred in nineteen hours to five and one half days. The clinical diagnosis was death due to intoxication and respiratory failure. Three necropsies revealed gastroenterocolitis, hepatitis, nephrosis and cerebral edema and congestion of toxic origin. Bronchopneumonia with nephrosis was diagnosed in 1 patient, the longest to live. All presented an exfoliative dermatitis. Chemical examination established the presence of boric acid in the fluid in the stomach and, by quantitative analysis, in the brain and liver. A concentration of 0.049 per cent was found in the liver (total, 61 mg.) and 0.025 per cent in the brain (total, 123 mg.) of 1 infant dying forty-five hours after the suspected feeding. By calculation, the amount of boric acid ingested must have been less than 3 Gm. Symptoms which developed progressively in this group were: vomiting and diarrhea, which increased in intensity after the first day; excoriations of the skin on the second and subsequent days; convulsive movements, especially of the facial muscles and the extremities; cyanosis and collapse as a terminal picture. Solutions of boric acid or sodium borate should be labelled "poison."

Diseases of Chest, Chicago

16:509-632 (Nov.) 1949

Closed Pneumonolysis (Enucleation Technique). I. A. Sarot, G. F. Herben and J. H. Cullen.—p. 509.
Pulmonary Resection in Tuberculosis: Correlation of Clinical Indications and Pathology. Y. F. Fujikawa and L. V. Ackerman. —p. 543.
Results of Oral BCG Vaccination on 348 Families. A. MacDowell. —p. 590.
Significance of Positive Cultures. I. D. Bobrowitz.—p. 600.
Fibromyxoma of Pleura: Report of Case. E. W. Hauch and W. W. Sittler.—p. 616.
Transpleural Endoscopic Approach to Autonomic Nervous System and Its Therapeutic Possibilities. E. Kux.—p. 625.

Illinois Medical Journal, Chicago

96:213-276 (Oct.) 1949

A Dean Looks at Medical Education and Practice. E. L. Turner. —p. 229.
Sir William Osler. F. Stenn.—p. 237.
Treatment of Brucellosis. C. W. Eisele and N. B. McCullough.—p. 241.
Demonstration of Organic Disease in "Functional Illness" by Skull X-Rays. J. J. Cohern.—p. 245.
Cholecystitis. A. Kraft and W. Wolf.—p. 249.
Significance of Rectal Bleeding and Importance of Diagnosing Early Cancer of Colon. W. G. Scott.—p. 252.
Fulminating Eclampsia Associated with Fibrinogenopenia and Hemorrhage. W. F. Killen and H. E. Schmitz.—p. 255.
Multiple Cystic Lymphangiomas of Omentum. E. J. Adamski, F. J. Walsh, J. K. Narat and A. F. Cipolla.—p. 259.

Industrial Medicine, Chicago

18:493-540 (Dec.) 1949. Partial Index

Influenza "B" Epidemic in Industrial Workers in Curacao. H. G. S. Van Raalte.—p. 493.
Management of Abdominal Injuries. W. C. Beck.—p. 505.
*Prophylaxis and Treatment of Common Cold with Neohetramine (Thonzylamine Hydrochloride). J. J. Arminio and C. C. Sweet. —p. 509.
Dermatologic Therapy with Cod Liver Oil Ointment. H. T. Behrman, F. C. Combes, A. Bobroff and R. Leviticus.—p. 512.
Nitroglycerin Reactions Among Pharmaceutical Workers. R. R. Bresler.—p. 519.
Psoriasis of Lower Leg: Industrial Complication. G. E. Morris. —p. 524.
Antihistaminic Analgesic Preparation in Therapy of Colds: Preliminary Report. W. F. P. Phillips and W. I. Fishbein.—p. 526.

Thonzylamine Hydrochloride (Neohetramine Hydrochloride®) for the Common Cold.—The six month prophylactic study conducted by Arminio and Sweet demonstrated that of 100 persons receiving 150 mg. of thonzylamine hydrochloride (neohetramine hydrochloride®) daily, third phase (purulent stage) colds developed in only 1 per cent; of 100 persons receiving 100 mg. daily, third phase colds developed in 3 per cent, and of 100 persons receiving 50 mg. daily, third phase colds developed in 12 per cent. In the control group of 300, the purulent phase developed in nearly 60 per cent. Furthermore, second and third phase colds developed in a combined 80.3 per cent of the 300 controls, as contrasted with 5.6 per cent in the three series of patients receiving thonzylamine hydrochloride. The therapeutic experiments with thonzylamine hydrochloride involved three groups, the first group receiving 50 mg. of thonzylamine hydrochloride three times a day for three days; the second group receiving a placebo, and the third group receiving drugs used in the usual treatment of the common cold, such as acetylsalicylic acid, nose drops and lozenges. It was found that the administration of thonzylamine hydrochloride during the first twenty-four hours relieved colds in one-fifth the time required for relief in patients receiving placebos; and, if the drug was given during the second twenty-four hours, the time required for complete relief was cut by half. By contrast, the group treated with acetylsalicylic acid showed no significant change.

Journal of Allergy, St. Louis

20:393-480 (Nov.) 1949

Significance of "Valence" in Antibody Interactions. H. N. Eisen and and F. Karush.—p. 393.
Experimentally Induced Insulin Resistance and Allergy in Rabbit. W. Franklin and F. C. Lowell.—p. 400.
Hypersensitivity to Mercuhydrin with Positive Skin Test to Post-Treated Mercuhydrin Serum. M. L. Gelfand.—p. 404.
Effect of Inhalation of Antigens by Guinea Pig on Production of Anaphylaxis. W. Leigh, J. Leger and B. Rose.—p. 411.
Studies in Bacterial Allergy. J. Holman and O. Swineford Jr.—p. 418.
Electrocardiographic Studies in Bronchial Asthma. J. Rose and W. Jend Jr.—p. 428.
Antihistamine Effects of N,N-Dimethyl-N'-(3-Thenyl)-N'-(2-Pyridyl)-Ethylenediamine (Thenfadil) Applied Topically. F. P. Luduena and E. Anarenko.—p. 434.
Clinical Studies with Iron as Adjunct to Pollen Immunization and Antihistaminic Therapy in Hay Fever. P. M. Schulman and A. M. Fuchs.—p. 444.
*Dry Patch Tests for Streptomycin Sensitivity. S. W. Simon.—p. 449.
How Far Can Wind-Borne Pollen be Disseminated? S. S. Sack. —p. 453.

Dry Patch Tests for Streptomycin Sensitivity.—In experiments carried out to determine the optimum strength of streptomycin to be used in patch testing, Simon found that concentrations of less than 1 per cent were unreliable and over

1 per cent could cause, in a sensitive person, exacerbation of the skin eruption and constitutional symptoms of fever, chills, nausea, vomiting, headache and malaise. The advent of dihydrostreptomycin (DHS) presented the problem of two separate sensitivities. Testing large numbers of persons with wet patches is time consuming. Fresh streptomycin or dihydrostreptomycin must be available because of instability in solution. Dry patches for streptomycin and dihydrostreptomycin were prepared after the method of Vollmer for old tuberculin patches. The patches were applied to the skin of the back over the scapula area. Before application, the skin was cleansed with acetone and allowed to dry. The patch was left in situ forty-eight hours. In none of the 248 persons tested was it necessary to remove the patch sooner. The area covered by the patch was read on removal and twenty-four and forty-eight hours later. Of the 182 nurses tested 160 had handled streptomycin for one week to three years. Eight positive reactions were obtained. Four nurses had the typical eruption on their hands, and 4 had no rash. There were no nurses with finger or hand lesions who gave negative reactions. Sixty-six tuberculous patients, who had received streptomycin by injection for an average of seventy days, in 11 of whom the injections had to be discontinued on account of toxic reactions, were likewise tested with dry streptomycin patches. Only two positive reactions were obtained in the entire group of 66 patients, one of them in the 11 who had had toxic reactions. Apparently systemic toxic reactions to treatment with streptomycin, even though a rash is produced, do not necessarily cause contact skin sensitivity to streptomycin.

Journal of Applied Physiology, Washington, D. C.

2:175-222 (Oct.) 1949

Study of Carbon Dioxide Present in Oral Cavity During Inspiration. C. A. Forssander.—p. 175.
Variability of Heart Rate in Relation to Age, Sex and Stress. R. B. Malmo and C. Shagass.—p. 181.
Effects of Environmental Heat Stress and Exercise on Renal Blood Flow and Filtration Rate. L. R. Radigan and S. Robinson.—p. 185.
*Enzyme Studies on Human Blood: VI. Prothrombin Content of Plasma Stored up to Six Years. G. Y. Shinowara.—p. 192.
Relationship Between Leg Strength, Leg Endurance and Other Body Measurements. E. R. Elbel.—p. 197.
*Responses to Hot and Cold Test Meals. A. Henschel, H. L. Taylor and A. Keys.—p. 208.
Gusto-Olfactory Thresholds in Relation to Appetite and Hunger Sensations. H. D. Janowitz and M. I. Grossman.—p. 217.

Prothrombin Content of Stored Plasma.—Shinowara determined the prothrombin content of citrated plasma that had been stored up to six years. The determinations were made by means of the new isolation technic and also by the thrombin technic. The results in percentages of prothrombin found in fresh normal plasma by the two technics are, respectively, as follows: plasma frozen for 15 months, 95 per cent and 69 per cent, and plasma dried for four to six years, 77 per cent and 78 per cent. It is concluded that plasma which has been frozen or dried a short time after withdrawal and then stored for a considerable length of time is an adequate source of prothrombin for transfusion and investigative purposes.

Temperature of Meals and Bodily Functions.—Henschel and associates investigated the effect of the temperature of a test meal on some of the bodily functions that are regulated at least in part by the autonomic nervous system. They found that gastric motility was not greatly altered. Blood sugar concentration was slightly and promptly increased after a test meal regardless of the temperature, but the response was significantly greater when the test meal was served cold. Finger skin temperature dropped as much as 3.5 C. (38.3 F.) and did not return to normal within 50 minutes after a cold test meal was ingested. Blood pressure increases of 15 to 20 mm. of mercury were produced during the time a 400 Gm. cold meal was eaten; no increase occurred with a 100 Gm. meal. The pulse rate was increased 18 to 20 beats per minute during the ingestion of the 400 Gm. cold meal. With the 100 Gm. cold test meal the maximal pulse rate increase was less than half as great, and the response was over by the time the meal had been ingested. The average systolic blood pressure response to the 400 Gm. cold test meal was about the same as that produced by immersion of the hand in ice water for one minute. None of the test meals produced significant electrocardiographic responses except for the cycle length.

Journal of Bacteriology, Baltimore

58:549-716 (Nov.) 1949. **Partial Index**

Growth of Mycobacterium Tuberculosis as Function of Its Nutrients. W. B. Schaefer, A. Marshak and B. Burkhart.—p. 549.
Antagonism to Sulfathiazole by Methylene Blue and Riboflavin in Pneumococcal Respiration. J. S. Gots and M. G. Sevag.—p. 585.
Streptococcus Lactis Host-Virus System: I. Factors Influencing Quantitative Measurement of Virus. W. B. Cherry and D. W. Watson.—p. 601.
Inhibition of Yeast Hexokinase by Homologous Antiserum. R. E. Miller, V. Z. Pasternak and M. G. Sevag.—p. 621.
Study of Lactic Acid Bacteria That Cause Surface Discolorations of Sausages. C. F. Niven Jr., A. G. Castellani and V. Allauson.—p. 633.
Chemical Detoxification of Flexner Dysentery Antigen: III. Mouse Test to Measure Toxicity Relative to Antigenicity. F. W. Barnes and M. D. Carroll.—p. 643.
Toxicity of Certain Amino Acids for Brucellae. V. T. Schuhardt, L. J. Rode and G. Oglesby.—p. 665.
Nuclei and Large Bodies of Luminous Bacteria in Relation to Salt Concentration, Osmotic Pressure, Temperature, and Urethane. F. H. Johnson and D. H. Gray.—p. 675.
Delayed Hydrolysis of Butterfat by Certain Lactobacilli and Micrococci Isolated from Cheese. M. H. Peterson and M. J. Johnson.—p. 701.

Journal of Clin. Endocrinology, Springfield, Ill.

9:1069-1244 (Nov.) 1949

Dietary Factors in Pathogenesis of Simple Goiter. M. A. Greer, M. G. Ettlinger and E. B. Astwood.—p. 1069.
Organic and Inorganic Iodine: Their Reciprocal Metabolic Fates. W. T. Salter, G. Karandikar and P. Block.—p. 1080.
Physiologic Activity of Tetrabromthyronine and Tetrachlorthyronine. J. Lerman and C. R. Harington.—p. 1099.
Thyroid Hormone-Like Properties of Tetrabromthyronine and Tetrachlorthyronine. C. E. Richards, R. O. Brady and D. S. Riggs.—p. 1107.
*Radioiodine Therapy of Metastases from Carcinoma of Thyroid: Six-Year Progress Report. S. M. Seidlin, I. Rossman, E. Oshry and E. Siegel.—p. 1122.
*Treatment of Metastatic Thyroid Cancer with Radioactive Iodine: Credits and Debits. J. B. Trunnell, L. D. Marinelli, B. J. Duffy Jr. and others.—p. 1138.
Function of Various Types of Thyroid Carcinoma as Revealed by Radioautographic Demonstration of Radioactive Iodine (I^{131}). P. J. Fitzgerald and F. W. Foote Jr.—p. 1153.
Method for Preoperative Estimation of Function in Thyroid Tumors: Its Significance in Diagnosis and Treatment. B. M. Dobyns, B. Sharpe and F. Maloof.—p. 1171.
Simplified Method for Determination of Protein-Bound Blood Iodine and Its Clinical Application. A. C. Connor, G. M. Curtis and R. E. Swenson.—p. 1185.
Basal Metabolism Testing Under Pentothal Anesthesia. E. C. Bartels.—p. 1190.
Statistical Study of Clinical Significance of Lymphocytic and Fibrocytic Replacements in Hyperplastic Thyroid Gland. F. B. Whitesell Jr. and B. M. Black.—p. 1202.
Nonencapsulated Sclerosing Tumors of Thyroid. J. B. Hazard, G. Crile Jr. and W. S. Dempsey.—p. 1216.
Current Treatment of Hyperthyroidism. J. deJ. Pemberton, S. F. Haines and F. R. Keating Jr.—p. 1232.

Radioiodine for Thyroid Metastases.—Seidlin and coworkers treated 12 patients, 3 men and 9 women between the ages of 20 and 69, with metastases from carcinoma of the thyroid, with radioactive iodine. Seven of this group are still living, with 3 greatly improved, 2 moderately improved and 2 unimproved. Five died; 3 of them were initially improved and 2 were admitted in terminal stages and did not show any improvement. Radiation or surgical thyroidectomy is regarded as a basic first step in the treatment. Radioiodine uptake can be induced in the metastases of most patients in this manner or by injections of exogenous thyroid-stimulating hormone. Thyroidectomy increases the thyroid-stimulating hormone production in the pituitary and removes the competition of the thyroid gland for both the thyroid-stimulating hormone and the iodine, thus enabling the tumor tissue to take over the function of the normal gland to varying degrees. After uptake has been demonstrated, the patient is treated with multiple large doses, usually 100 millicuries or more, of radioactive iodine. One of the treated patients was followed for six years after the initiation of therapy. A recently excised skull metastasis showed complete necrosis with no evidence of viable tumor tissue. It was observed that the necrotic debris from the destroyed metastatic tumor could still concentrate radioiodine.

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Radioactive Iodine in Metastatic Thyroid Cancer.—Trunnell and co-workers treated 24 patients with cancer of the thyroid with pulmonary and skeletal metastases, with radioactive iodine. Only 1 of the 24 patients had metastatic tumor tissue which concentrated enough radioactive iodine to justify administering of the isotope in a therapeutic dose before subjecting the patient to removal or destruction of the normal thyroid. Total removal or destruction of the normal thyroid was carried out in the remaining 23 patients. One or more metastases in 12 of these patients were observed to concentrate considerably more iodine than before removal of the normal thyroid. Treatment with thyroid-stimulating hormone resulted in an increased avidity for radioactive iodine in 3 of 6 patients whose normal thyroid had been removed. The patients who had undergone thyroidectomy and whose metastatic lesions acquired significant degrees of avidity for radioactive iodine were treated for several weeks to months with thiouracil or propylthiouracil. A decided increase in the iodine-collecting capacity of the metastatic lesions was observed in 7 patients after cessation of the administration of these drugs. These methods of increasing the iodine-collecting capacity of metastatic cancer of the thyroid made it possible to localize therapeutic amounts of radioactive iodine in tumors which otherwise would not have been treatable with this agent. They were equally important in showing that certain cancers of the thyroid are capable of responding to the organism's need for thyroid hormone by assuming the function of the parent organ, and of responding to the thyrotropic hormone. These facts would indicate that these cancers can be influenced by certain normal physiologic mechanisms. The methods of altering function of the metastases are to be considered as due to the treatment with radioactive iodine. There was a definite clinical improvement in 4 of 9 patients subjected to intensive treatment with the eight day half-life radioactive isotope of iodine. The total cumulative doses administered to these patients varied between 144 millicuries and 906 millicuries. A tumoricidal effect as evidenced by shrinkage of the tumor mass and by histologic evidence of cell destruction was observed in these patients. Certain toxic effects resulted from the treatment of metastatic cancer of the thyroid with large doses of radioactive iodine. Hyperthyroidism with elevated serum precipitable iodine occurred in 3 euthyroid persons having normal thyroids or functioning metastases after the administration of large doses of I^{131}. Amenorrhea occurred in 3 women less than 41 years of age who had received large doses of I^{131}. A depression of hematopoiesis was observed in all the patients who were subjected to intensive treatment with radioactive iodine. Decrease in one or more peripheral blood elements, decreased cell counts and reversal of the erythroid myeloid ratios were demonstrated by bone marrow aspiration biopsies.

Journal Industrial Hygiene & Toxicology, Baltimore

31:311-376 (Nov.) 1949

Subacute Vapor Toxicity and Range-Finding Data for Ethyl Acrylate. U. C. Pozzani, C. S. Weil and C. P. Carpenter.—p. 311.
Toxicity of Methyl and Ethyl Acrylate. J. F. Treon, H. Sigmon, H. Wright and K. V. Kitzmiller.—p. 317.
Solubility of Lead Compounds in Human Pleural Fluid and Blood Serum. G. C. Harrold.—p. 327.
Seizures, Head Injuries and Litigants. G. H. Hyslop.—p. 336.
Assay of Acute Vapor Toxicity, and Grading and Interpretation of Results on 96 Chemical Compounds. C. P. Carpenter, H. F. Smyth Jr. and U. C. Pozzani.—p. 343.
Health of Workers Exposed to Galena. E. A. Belden and L. F. Garber.—p. 347.
*Fatality and Illness Caused by Ethylene Chlorhydrin in Agricultural Occupation. A. F. Bush, H. K. Abrams and H. V. Brown.—p. 352.
Study of Workers Exposed to Talc and Other Dusting Compounds in Rubber Industry. W. L. Hogue Jr. and F. S. Mallette.—p. 359.
High Concentration-Short Time Exposures and Toxicity. B. G. King.—p. 365.

Fatality and Illness Caused by Ethylene Chlorhydrin.—Bush and associates report the death of 1 man and the illness of 5 workers who were engaged in treating seed potatoes with ethylene chlorhydrin (2 monochloroethyl alcohol [$ClCH_2CH_2OH$]). The material is used to reduce the period of dormancy of the germination of seed potatoes. It is often desirable to plant potatoes that have been out of the ground only a few weeks. Ordinarily, untreated potatoes have a dormancy period of about 90 days, but treatment with ethylene chlorhydrin will reduce it to only a few days. The histories of patients with poisoning and the results of animal experimentation suggest that once a fatal dose has been absorbed death is certain, although it is generally delayed for a few hours. In cases not fatal within twelve to eighteen hours the victims probably eventually recover. Treatment is essentially supportive: warmth, rest, parenteral dextrose solution (hypertonic to combat cerebral edema) and stimulants, such as caffeine and camphor. Epinephrine should not be administered, as it tends to produce ventricular fibrillation, which is also likely to be produced by the chlorinated hydrocarbons. The authors feel that the maximum allowable concentration (M.A.C.) for ethylene chlorhydrin should be only 2 parts per million. In the reported cases the estimated concentration was 300 to 500 parts per million by inhalation plus possibly some cutaneous absorption. Workers engaged in the manufacture or the use of ethylene chlorhydrin should be regularly examined, since the poisoning is subtle and irreparable damage may occur before disturbing clinical signs are manifest.

Journal of Infectious Diseases, Chicago

85:107-204 (Sept.-Oct.) 1949. **Partial Index**

Asexual Reproduction of Plasmodium Knowlesi in Rhesus Monkeys. W. H. Taliaferro and L. G. Taliaferro.—p. 107.
Metabolic Changes in Oral Lactobacilli. T. B. Coolidge, N. B. Williams, A. E. I. Ebisch and E. A. Hodges.—p. 126.
Feeding Tests on Human Volunteers with Enterococci and Tyramine. G. M. Dack, C. F. Niven Jr., J. B. Kirsner and H. Marshall.—p. 131.
Complement Fixation with Fecal Antigens in Viral Hepatitis. W. P. Havens Jr., H. Lloyd, J. L. Mehnick and J. W. Colbert Jr.—p. 139.
Toxemia as Stimulation Factor in Production of Antibodies: Studies on Precipitin Production in Dog. L. S. Mann and W. H. Welker.—p. 146.
Relative Susceptibility of Aëdes Aegypti, Aëdes Albopictus, Aëdes Canadensis and Anopheles Quadrimaculatus to Plasmodium Gallinaceum. W. Cantrell and H. B. Jordan.—p. 170.
Nutrition and Poliomyelitis. Effects of Deficiencies of Phosphorus, Calcium, and Vitamin D on Response of Mice to Lansing Strain of Poliomyelitis Virus. C. Foster, J. H. Jones, W. Henle and S. A. Brenner.—p. 179.
Field Trial of Shigella Flexneri III Vaccine: II. Serum Agglutination Studies. I. L. Bennett Jr., R. S. Gordon and L. A. Barnes.—p. 180.
Inhibition of Pyruvate Oxidation in Malarial Parasite Plasmodium Gallinaceum by Quinine Treatment of Host. J. W. Moulder.—p. 195.

Journal-Lancet, Minneapolis

69:377-414 (Nov.) 1949

Surgery of Sympathetic Nervous System. C. S. MacCarty.—p. 377.
Treatment of Rheumatic Diseases with Glucuronic Acid: Preliminary Report. J. H. Hodas, H. Brandon and J. F. Maloney.—p. 385.
Headache and Headache Pain. J. J. Ayash.—p. 389.
Analytical Hypertension: Clinical Observation of 2,163 Male Students. C. A. McDonald and W. J. O'Connell.—p. 395.
What Can Be Done for Deaf Patient? W. K. Wright.—p. 398.
Well Baby Care. H. G. Skinner.—p. 403.

Journal National Malaria Society, Columbia, S. C.

8:175-246 (Sept.) 1949

Development of Sporozoites of Plasmodium Gallinaceum into Cryptozoites in Tissue Culture. I. N. Dubin, R. L. Laird and V. P. Drinnon.—p. 175.
Malaria Observation Stations of Public Health Service. G. H. Bradley and M. H. Goodwin Jr.—p. 181.
Observations on Dispersal of Anopheles Quadrimaculatus Say from Breeding Area. M. H. Goodwin Jr.—p. 192.
Routine Culture Methods in Diagnosing Endamoeba Histolytica. R. L. Laird, V. P. Drinnon and A. B. Davis.—p. 198.
Parasites Found in Certain Sciuridae of Southwestern United States. T. H. Tomlinson Jr., V. H. Fogg and C. S. Smith.—p. 202.
Investigations on Mosquito Transmission of Plasmodium Elongatum Huff, 1930. D. W. Micks.—p. 206.
Parasites Resembling Plasmodium Ovale in Strains of Plasmodium Vivax. M. D. Young and D. E. Eyles.—p. 219.
Winter Study of Anopheles Mosquitoes in Southwestern Georgia, with Notes on Some Culicine Species. J. W. Zukel.—p. 224.
Observations on Ovarian Development and Fat Accumulation in Anopheles Quadrimaculatus and Anopheles Punctipennis. J. W. Zukel.—p. 234.
Second Year's Field Trial with Chloroquine Suppression of High Endemic Malaria in Panamanian Village. T. H. Boldt and C. H. Goodwine.—p. 238.

Journal of Neurosurgery, Springfield, Ill.

6:439-550 (Nov.) 1949

Metastasizing Cerebellar Tumors: Difficulty in Distinguishing Between Medulloblastoma and Neuroblastoma. R. P. Barden and F. H. Lewey.—p. 439.
*Protruded Lumbar Intervertebral Disc: Results Following Surgical and Non-Surgical Therapy. B. M. Shinners and W. B. Hamby. —p. 450.
Chronic Posttraumatic Headache and Syndrome of Cervical Disc Lesion Following Head Trauma. A. A. Raney, R. B. Raney and C. R. Hunter.—p. 458.
Transient Hemiplegia Associated with Cerebral Angiography (Diodrast). J. G. Chusid, F. Robinson and M. P. Margules-Lavergne.—p. 466.
*Arteriovenous Aneurysms of Brain: Report of 10 Cases of Total Removal of Lesion. G. Norlén.—p. 475.
Clinical Analysis of 88 Cases of Metastatic Carcinoma Involving Central Nervous System with Outline of Therapeutic Principles. A. R. Elvidge and M. Baldwin.—p. 495.
Surgery of Craniopharyngiomas. P. D. Gordy, M. M. Peet and E. A. Kahn.—p. 503.
Occurrence of Hemangioblastomas (Two Cerebellar and One Spinal) in Three Members of One Family. W. M. Craig and G. Horrax. —p. 518.

Protruded Lumbar Intervertebral Disks.—Shinners and Hamby sent questionnaires to 355 patients with protruded lumbar intervertebral disk who had been operated on and to 200 such patients who had not been operated on. Of the group which had undergone operation, 48.5 per cent considered themselves cured and 39 per cent benefited by operation, while only 29.5 per cent of the group not operated on had recovered. More patients in both groups are working than admit to being well. Of the group operated on 91.5 per cent are working, and of the group who had not received surgical treatment 85 per cent are working. Simple removal of disk protrusions was done in 81 per cent of the patients operated on. This was combined with or followed by spinal fusion in 19 per cent of the cases. Simple removal of disk protrusions was followed by definitely better results than removal combined with spinal fusion. Definitely better surgical results were obtained in private than in compensation patients. The private patient works in spite of, or adjusts his work to, some postoperative disability, but the compensation patient who admits that he is cured must expect to return to his original work, which may be too heavy for his back after operation.

Arteriovenous Aneurysms of Brain.—Cushing and Bailey in 1928 considered arteriovenous aneurysms of the brain practically inoperable and recommended decompression and roentgen treatment. In a monograph on angiomatous malformations and tumors of the brain published in 1936 by Bergstrand, Olivecrona and Tönnis, there are reported 5 cases in which arteriovenous aneurysms of the brain were successfully removed. Norlén reports 10 cases in which he removed an intracerebral arteriovenous aneurysm. The clinical result of the operation was good in 7 patients, all of whom are able to work. This result is anticipated also in another patient. Improvement occurred in 2 patients, but both are invalids, one with a pronounced aphasia and the other with hemiparesis. Even if further improvement should be possible, the destruction of brain tissue from the intracerebral hemorrhage was too extensive to permit these patients to regain full working capacity. The most interesting fact was the angiographic study of the brain circulation and the appearance of the brain vessels before and after removal of the lesion. In most cases there was a rapid return to normal, usually within two to three weeks, of vessels which before the operation were enlarged or tortuous. In other cases pathologic vessels were still visible in the angiogram after that time, but a few months later they regained their normal appearance. From angiograms performed before operation it was evident that the contrast filling of vessels not belonging to the group of vessels connecting with the aneurysm was poor. This might indicate poor nutrition and anoxemia of these parts of the brain, which might cause brain atrophy and be responsible for the mental symptoms common in the inveterate cases. The contrast filling of the vessels of these parts of the brain was good after the removal of the aneurysm.

Journal of Nutrition, Philadelphia

39:139-286 (Oct.) 1949. Partial Index

Experimental Rat Caries: II. Location, Sequence and Extent of Carious Lesions Produced in Norway Rat When Raised on Generally Adequate, Finely Powdered, Purified Ration. R. F. Sognnaes.—p. 139.
Urinary Excretion of Pentose- and Phosphorus-Containing Complexes in Nutritional Muscular Dystrophy. A. S. Minot and M. Grimes. —p. 159.
Essential Amino Acid (Except Tryptophan) Content of Colostrum and Milk of Cow and Ewe. K. A. Kuiken and P. B. Pearson.—p. 167.
Nutritive Value of Canned Foods: I. Amino Acid Content of Fish and Meat Products. M. S. Dunn, M. N. Camien, S. Eiduson and R. B. Malin.—p. 177.
Influence of Optical Isomerism and Acetylation upon Availability of Tryptophan for Maintenance in Man. H. R. Baldwin and C. P. Berg.—p. 203.
Minimum Riboflavin Requirement of Infant. S. E. Snyderman, K. C. Ketron, H. B. Burch and others.—p. 219.

J. Venereal Disease Information, Washington, D. C.

30:309-338 (Nov.) 1949

*Treponemal Immobilization Test of Normal and Syphilitic Serums. H. J. Magnuson and F. A. Thompson Jr.—p. 309.
Penicillin in Treatment of Early Syphilis: 639 Patients Treated with 2,400,000 Units of Sodium Penicillin in 7½ Days. H. N. Bundesen, F. Plotke, G. X. Schwemlein and J. Rodriquez.—p. 321.
Effect of Temperature Variants on Quantitative Turbidimetric Determinations of Spinal Fluid Protein, Using Trichloracetic Acid. V. L. Harding and A. Harris.—p. 325.

Treponemal Immobilization Test.—Magnuson and Thompson direct attention to the in vitro test for immobilizing antibodies against Treponema pallidum reported by Nelson and Mayer. They review results obtained with this test on 362 patients with syphilis, 81 patients with disease other than syphilis, 73 normal persons and 91 normal rabbits. No positive reactions to this test have been encountered in any of the nonsyphilitic persons. In syphilitic patients, the immobilizing antibody develops fairly early in the course of the disease, and the percentage of positive reactions to the immobilization tests increases with the duration of the disease. Modifications in technic have been suggested that would permit more extended assays with the same amount of materials. The variability of the tests in normal persons and animals has suggested upper limits of normality. The immobilizing substance appears to be an antibody associated with the globulin fractions of serum protein. The authors feel that, while the immobilization technic may offer an important tool to the research laboratory in the investigation of problems of immunity in syphilis and in the study of biologic false positive reactions to serologic tests for syphilis, the reliability and significance of the test need further evaluation.

Laryngoscope, St. Louis

59:1177-1286 (Nov.) 1949. Partial Index

Surgical Procedures Directed Toward Prevention of Hearing Impairment in Children. P. E. Meltzer.—p. 1225.
Cardiovascular Epistaxis and Naso-Nasopharyngeal Plexus. G. H. Woodruff.—p. 1238.
Use of Radium in Middle Ear for Selected Cases of Chronic Otitis Media. W. W. Wilkerson Jr., L. F. Cayce and J. McK. Ivie. —p. 1248.
Irradiation Therapy of Fenestration and Radical Mastoidectomy Cavities. G. O'N. Proud and T. E. Walsh.—p. 1255.
*Effectiveness of Dramamine in Relieving Vestibular Reactions Following Labyrinthine Fenestration Operation. E. H. Campbell. —p. 1261.
Idiopathic Supraorbital Neuralgia. T. E. Beyer.—p. 1273.

Use of Dimenhydrinate After Fenestration.—Campbell points out that dimenhydrinate (β-dimethylaminoethyl benzohydryl ether 8-chlorotheophyllinate), a new antihistaminic drug, has been recommended as a prophylactic against motion sickness. It was suggested that this preparation might be effective in relieving or preventing the vertigo, nausea and vomiting of pathologic conditions of the vestibular apparatus such as Ménière's disease and the reactions following the labyrinth fenestration operation for otosclerosis. The postoperative vertigo, nausea and vomiting of 28 patients who had undergone fenestration and who were given dimenhydrinate during the day of operation and the day following were carefully observed and compared with the established normal reactions of untreated patients. These observations revealed that the patients who were given dimenhydrinate experienced a moderate

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reduction of the postoperative symptoms on the day of operation over the untreated patients and a considerable lessening of these symptoms on the day after the operation.

Medical Annals of District of Columbia, Washington

18:561-618 (Nov.) 1949

Use of Curare in Obstetrics: Preliminary Report. H. Katzman, J. M. Friedman, S. Katzman and S. M. Dulek.—p. 561.
Abdominal Epilepsy. H. Stevens.—p. 565.
Electrocardiographic Changes in Acute Appendicitis: Report of Case. J. W. Couch and H. H. Schoenfeld.—p. 569.
*Erythema Nodosum in Eighteen-Month-Old Infant Which Led to Discovery of Moderately Advanced Tuberculosis in the Mother. R. O. Warthen.—p. 572.
Primary Carcinoma of Liver: Report of Two Cases. J. T. McNally and A. J. Finestone.—p. 573.

Erythema Nodosum in Infant and Tuberculosis in Mother.—Warthen reports an 18 month old infant with symptoms of erythema nodosum. Roentgen examination of the mother's chest disclosed an exudative infiltrate with cavitation in the right upper lobe which was designated as moderately advanced active tuberculosis. The case illustrates the importance of searching for tuberculous contacts in cases of erythema nodosum. The clinical manifestations of erythema nodosum are probably the reactions of a sensitized person to a wide variety of sensitizing or antigenic substances. These sensitizing agents may be bacterial, toxic or chemical. The most frequently encountered agent is the tuberculoprotein of the tubercle bacillus, as evidenced by the discovery of coexisting tuberculosis (diagnosed by means of chest roentgenograms and/or tuberculin skin tests) in the majority of cases.

Minnesota Medicine, St. Paul

32:1057-1160 (Nov.) 1949

Roentgen Diagnosis of Lesions of Urinary Tract. H. D. Kerr.—p. 1077.
Clinical Aspects of Management of Endometriosis. C. P. Huber.—p. 1086.
Surgical Aspects of Management of Endometriosis. R. E. Campbell.—p. 1089.
Trauma to Nervous System. E. M. Hammes Jr.—p. 1092.
Spinal Cord Injuries. G. S. Baker.—p. 1094.
Technique of Peripheral Nerve Surgery. R. G. Spurling.—p. 1096.
Surgeon and Cancer Problem. O. H. Wangensteen.—p. 1101.
Reversible Forms of Heart Disease. J. F. Briggs.—p. 1106.
Slipping of Capital Femoral Epiphysis. S. W. Shimonek.—p. 1110.
Presence of Sodium in Natural Water and Softened Hard Water in Relation to Low Sodium Diets. C. B. Nelson, H. R. Shipmen and D. Taylor.—p. 1112.

Nebraska State Medical Journal, Lincoln

34:405-436 (Dec.) 1949

Urinary Complications During Pregnancy and Puerperium. K. E. Barber.—p. 408.
Congenital Anomalies of Gastro-Intestinal Tract. J. A. Bigler.—p. 412.
*Radioiodine in Treatment of Thyroid Disease. H. B. Hunt, R. C. Moore, C. S. Hatchett and E. S. Pederson.—p. 416.

Radioiodine in Thyroid Disease.—Hunt and his associates used radioiodine in 45 patients with thyrotoxicosis, of whom 31 had diffuse toxic goiter and 14 had toxic nodular goiter. Five patients with cancer of the thyroid were seen in consultation, and 4 were treated. Many radioiodine thyroid accumulation tests were run, both in connection with the patients treated, for the exclusion of unfavorable cases, and for general evaluation of thyroid activity. Remissions of thyrotoxicosis induced by radioiodine were comparable to those following subtotal thyroidectomy. The treatment is readily applicable to inoperable and recurrent cases. Diffuse toxic goiters showed an average twenty-four hour retention of 78 per cent and the toxic nodular goiters a retention of 60 per cent of the dose administered orally. Thyroids retaining less than 50 per cent of radioiodine generally responded unsatisfactorily. It was found that thiouracil must be stopped two to three days prior, and Lugol's solution one to three weeks prior to administration of radioiodine as a test of thyroid activity or as a therapeutic agent. Response of thyrotoxicosis to radioiodine is indicated by reduction of the basal metabolic rate from an average of plus 44 to an average of minus 3, lowering of the average pulse rate from 114 down to 80 and an average gain of 11 pounds (5 Kg.) over a period of ten weeks. Operation still offers a more rapid remission in diffuse toxic goiter and a more certain control of many nodular goiters. Of 5 patients with carcinoma of the thyroid, only 2 with follicular adenocarcinoma have benefited from radioiodine in addition to total thyroidectomy and high voltage roentgen therapy.

New England Journal of Medicine, Boston

241:725-762 (Nov. 10) 1949

Carcinoma of Eyelid: Analysis of 301 Cases and Review of Literature. C. G. Stetson and M. D. Schulz.—p. 725.
*Chloromycetin in Treatment of Pneumonia in Infants and Children: Preliminary Report on 33 Cases. A. Recinos Jr., S. Ross, B. Olshaker and E. Twible.—p. 733.
*Relief of Chest Pain by Tetraethylammonium Chloride. H. I. Israel, E. L. Kerter, F. E. Urbach and W. D. Willis.—p. 738.
Thephorin Ointment in Pruritic Dermatoses. C. S. D'Avanzo.—p. 741.
Use of Wettable DDT in Pediculosis. G. E. Morris.—p. 742.
Hemorrhagic Diseases (Concluded). W. B. Frommeyer and R. D. Epstein.—p. 743.
Colloid Carcinoma of Rectum, with Metastases to Regional Lymph Nodes in Sixteen-Year-Old Boy.—p. 751.
Coronary Thrombosis, Myocardial Infarction, Multiple Embolization of Mesenteric and Femoral Arteries. Gangrene of Ileum.—p. 753.

Chloramphenicol (Chloromycetin®) in Pneumonia in Children.—During the winter of 1948 and 1949, a pneumonia ward was established at the Children's Hospital, Washington, D. C., to study the efficacy of chloramphenicol (chloromycetin®) and aureomycin in the treatment of pneumonia. During a four month period 39 patients were treated with aureomycin and 33 with chloramphenicol. This report by Recinos and associates deals with the results obtained in the latter group. The ages of the children ranged from 4 months to 12 years. All had bacterial pneumonia. Twenty of the 33 patients were seriously ill; 11 were moderately ill, and 2 mildly ill. The temperature at the time of the institution of choramphenicol therapy was above 103 F. in all but 6 patients. Chloramphenicol was administered orally in a dosage ranging from 50 to 220 mg. per kilogram of body weight every twenty-four hours. The dosage interval was three or four hours. Treatment was continued for two to six days. The total dose of chloramphenicol ranged from 3.4 to 11.3 Gm., with an average of 5.9 Gm., per patient. Only in the older age group was it possible to administer an intact capsule. In infants and young children the content of the capsule was given in vehicles such as aromatic eriodictyon syrup, chocolate milk, cocoa syrup, cherry syrup, applesauce and lemon juice. Mixing the drug with aromatic eriodictyon and following it with chocolate milk was perhaps the best method. The therapeutic effect, which was based principally on the rapidity of return to normal or on clinical, roentgenologic and laboratory findings, was considered favorable in all but 1 patient. In 32 of the 33 patients the temperature had returned to normal within three days of the institution of therapy. Chloramphenicol may be regarded as an effective drug in the therapy of bacterial pneumonia.

Tetraethylammonium Chloride for Chest Pain.—Israel and his collaborators administered tetraethylammonium chloride to 40 patients with chest pain. The pain was caused by trauma, pneumonia, pleuritis, tuberculosis, neoplasm, mediastinal emphysema or myocardial infarction. Tetraethylammonium chloride was given intravenously, each cubic centimeter of solution containing 100 mg. of the drug. Injection was made slowly into one arm while the blood pressure was being measured in the other arm; administration was suspended if the diastolic blood pressure fell and was resumed as the pressure rose. Originally the authors administered 3 or 4 cc. of solution (300 to 400 mg.), but since in many patients only 2 or 3 cc. could be administered, they now give the smaller dose of 3 mg. per kilogram of body weight. Diminution of pain was noted in all patients. In some the effect was slight, being manifested chiefly by ability to breathe more deeply; in others the relief was considerable, although brief in duration, but in the majority of patients relief was great and prolonged. The degree and duration of relief seemed to be influenced by the age of the patient as well as by the nature of the lesion responsible for the pain. Patients less than 50 years of age obtained satisfactory relief more often than older patients; however, relatively few older persons were treated because of reluctance to use this

drug in patients with degenerative changes. The authors feel that their results justify a further trial of tetraethylammonium chloride for the treatment of severe chest pain.

241:763-798 (Nov. 17) 1949

*Genesis of Heart Sounds. O. Orias.—p. 763.
Physiologic Components of Urinary Bladder: Their Clinical Significance. S. R. Muellner.—p. 769.
Geriatric Dermatoses. C. G. Lane and E. M. Rockwood.—p. 772.
Reactions from Use of Benzohexane (833 F) in Diagnosis of Pheochromocytoma. V. A. Drill.—p. 777.
Biochemistry and Clinical Applications of Vitamin P. B. A. Levitan.—p. 780.
Benign Gastric Ulcer of Greater Curvature.—p. 789.
Carcinoma of Gall Bladder, with Extension to Extrahepatic Bile Ducts and Peripancreatic Nodes, and Metastases to Lungs and Bones. —p. 791.

Genesis of Heart Sounds.—Orias of Cordoba, Argentina, says that at least four sounds may occur under normal conditions during the heart cycle. Two sounds, the classic first and second sounds, are heard on any living person. A third heart sound may be heard during early diastole in many young persons after the second sound, and the fourth sound, also called auricular, takes place and may often be heard immediately before the first sound during auricular systole. There is experimental and clinical evidence pointing to four factors as contributing to the formation of the first heart sound: muscular contraction and tension of the ventricular walls at the onset of ventricular systole (muscular factor), closure of the auriculoventricular valves (valvular factor), movements and distention caused by the ejection of blood from the ventricles into the arteries (vascular factor) and residual vibrations due to the preceding auricular contraction. The second heart sound is due to vibrations produced by the closure of the semilunar valves on the valves themselves, in the walls of the arteries (pulmonary and aorta) and also in the blood column. The third heart sound is caused by vibrations of the ventricular walls due to their sudden distention by the inrush of blood from the auricles in the final moments of rapid ventricular filling. Muscular contraction and distention, passage of blood through the auriculoventricular orifices, distention of ventricular walls by the inrush of blood and friction of the auricle against neighboring structures are the underlying factors in auricular sound.

New York State Journal of Medicine, New York

49:2479-2606 (Nov. 1) 1949

Cerebral Palsies: Their Diagnosis, Classification and Treatment. W. D. Dugan.—p. 2535.
Treatment of Comminuted Colles' Fracture by Ulnar Styloid Resection. C. F. Freese.—p. 2540.
Fractures of Femur in Children. F. N. Potts and W. A. Dunham. —p. 2543.
Orthopedic X-Ray Problems in Children. G. N. Scatchard.—p. 2545.
Diphtheria Immunity in High School Seniors. E. A. Lane and W. A. Holla.—p. 2548.
Poliomyelitis at Meadowbrook Hospital, 1948. G. F. Robertson. —p. 2550.
Practical Open-Scale Thermometer for Timing Human Ovulation. E. F. Keefe.—p. 2554.
Failure of Antihistaminic Drugs to Inhibit Diodrast Reactions. S. B. Crepea, J. C. Allanson and L. DeLambre.—p. 2556.
High Cervical Esophagogastrostomy for Carcinoma of Cervical Esophagus Extending into Superior Mediastinum: Value of Right-Sided Combined Thoracoabdominal Approach. J. W. Lord Jr. and S. A. Localio.—p. 2559.
Cancer and Cardiovascular Diseases. E. Foldes.—p. 2563.

49:2607-2734 (Nov. 15) 1949

*Management of Symptom Complex in Acute Poliomyelitis. E. Smith, D. J. Graubard and P. Rosenblatt.—p. 2655.
Dissecting (Intramural) Diverticulitis. S. E. Cohen.—p. 2661.
Unusual Case of Anthracosilicosis. F. S. Preuss.—p. 2667.
*Review of Diagnosis of Malignant Cells in Serous Fluids, Sputa, and Bronchial Secretions. A. B. Constantine and D. N. Shaver.—p. 2673.
Needle Biopsy of Liver in Alcoholic Patients. S. Sanes, R. C. Bahn, W. H. C. Chapple and N. Chassin.—p. 2677.
Toxicology Laboratory and Its Importance to Community. N. C. Klendshoj and M. Feldstein.—p. 2682.
Application of Sponge Biopsy for Cancer Diagnosis in Office Practice. S. A. Gladstone.—p. 2687.
Use of Dicumarol in Acute Myocardial Infarction. S. L. Frank. —p. 2694.
Report on Use of Sodium Pteroyl Triglutamate in 413 Cases. S. M. Hardy, A. L. Joyner and R. W. Howard.—p. 2697.

Management of Acute Poliomyelitis.—Because of the belief that much of the pain and spasm in acute poliomyelitis is due to the spread of waves of nervous excitation along the sympathetic nerves with resultant vasoconstriction and ischemic changes, Smith and his associates attempted to block or interrupt these pathways. The drugs used were procaine hydrochloride, diethylaminoethanol hydrochloride and priscoline® (2-benzyl-4,5-imidazoline hydrochloride). The authors used priscoline® intramuscularly in 120 patients whenever there was acute pain, hyperesthesia or muscle spasm. In those over 16 years of age the initial dose was 50 mg. If the patient flushed, he was given 50 mg. every three or four hours. If he did not flush, the dose was increased 12.5 mg. every three or four hours until the amount necessary to produce the flush was found. This amount or the next smaller dose was then used as a maintenance dose. As soon as the pain and muscle spasm subsided, priscoline® given by the oral route was substituted. The oral dose was usually higher than the intramuscular. For children between 5 and 16, the initial dose was 25 mg. and to children below 5 years of age elixir of priscoline® was given, the initial dose being 10 mg. Priscoline® caused no serious secondary effects, except that 5 per cent of the patients had nausea and vomiting. Repeated examination of blood and urine revealed no changes. The longest period of administration of priscoline® was seven and one-half months. The drug produced a sense of well-being. The patients rested more comfortably during the day and slept quietly at night. The appetite improved. The acute pain subsided quickly, and extremities, flexed because of pain or spasm, were easily straightened. Muscle twitchings quickly disappeared. The cold and clammy skin became warm. Nearly all the patients improved so rapidly that it was possible to transfer the majority, relaxed and free of pain, to their homes or orthopedic hospitals in seven to fourteen days.

Malignant Cells in Serous Fluids, Sputums and Secretions.—Constantine and Shaver review the routine examination of body fluids and secretions submitted to their laboratory for tumor cell detection. Fluids and secretions were fixed in 10 per cent formaldehyde in approximately 1 part formaldehyde to 5 parts fluid. It was requested that the fixative be added immediately after the specimen was obtained either on the ward or at the clinician's office. After fixation, the supernatant was decanted and 95 per cent alcohol added to aid in holding the coagulum together. This mixture was centrifuged and the alcohol decanted. The coagulum was dehydrated, embedded in paraffin, cut and stained with hematoxylin and eosin. The advantage of this sectioned sediment method is primarily in preserving clumps of cells and cells in their original acinar or papillary arrangement. In a few cases special stains for mucus and melanin were added. Carcinomatous pleural or ascitic effusions were diagnosed by this method with an accuracy of approximately 60 to 75 per cent. Sputum diagnosis in histologically proved bronchogenic cancer was positive in 33.3 per cent of the cases. Bronchial secretion diagnosis in histologically proved bronchogenic cancer was positive in 46 per cent of the cases. No false positive reports were encountered in 287 body fluids and secretions obtained from 223 patients.

North Carolina Medical Journal, Winston-Salem

10:577-624 (Nov.) 1949

Present Trends in Treatment of Syphilis. H. J. Magnuson.—p. 577.
Allergy in General Practice. M. S. Clark.—p. 580.
Subparietal Rupture of Intestine Incident to Severe Abdominal Muscular Effort: Report of 2 Cases. G. R. Benton Jr.—p. 584.
Laboratory Procedures in Private Practice of Pediatrics. W. M. Kelsey.—p. 587.
Psychosomatic Approach in Pediatrics. F. H. Richardson.—p. 590.
Obstruction of Aqueduct of Sylvius as Cause of Internal Hydrocephalus and Death: Report of 2 Cases. C. C. Carpenter and P. H. Dillard.—p. 594.
Spinal Subarachnoid-Ureteral Anastomosis for Communicating Congenital Hydrocephalus. B. Woodhall.—p. 598.
*Treatment of Tuberculosis of Larynx with Streptomycin. E. J. Chapman.—p. 601.
Fibrosarcoma of Extremities: Review of 38 Cases. C. A. Zarzecki. —p. 605.
William Osler: IX. Osler as Clinician. F. J. Sladen.—p. 607.

Streptomycin for Tuberculosis of Larynx.—Chapman used streptomycin since November 1946 in the treatment of 18 patients with laryngeal tuberculosis. Sixteen of these had far advanced and 2 moderately advanced pulmonary tuberculosis.

The laryngeal involvement in 16 was healed by the streptomycin therapy, although 4 had later recurrent laryngeal lesions. In 2 of these the recurrences were healed with voice rest and cauterization, and in the other 2 a second course of streptomycin produced healing. One patient had a third recurrence and died without obtaining relief from the drug. Two patients have had negative sputum for two years, and in a third patient the sputum has been negative for three months. These 3 patients show decided pulmonary improvement. Three other patients show definite pulmonary improvement but still have positive sputum. Eight patients show only slight to moderate improvement in their pulmonary lesion, and all these still have a positive sputum. Four patients died. In 1 case the laryngeal lesion healed, but the patient died of tuberculous meningitis. In another case the laryngeal lesion healed, but the patient died of a recurrence. One patient was allergic to streptomycin, and the drug was discontinued after three weeks. The other patient received no benefit from twelve weeks of streptomycin therapy. The time required to heal the laryngeal lesions varied from one to four months. The period of treatment ranged from three weeks to eight months. The daily dose in most cases was 1 Gm. Streptomycin therapy offers the most effective means of treating laryngeal tuberculosis at the present time, but, because the organisms may become resistant to the drug, streptomycin should be used only after other methods have proved ineffective in controlling the laryngeal complications.

Northwest Medicine, Seattle

48:737-816 (Nov.) 1949

Bedside Diagnosis of Jaundice. F. W. Hoffbauer.—p. 737.
Talc Granuloma. A. R. MacKay and G. A. C. Snyder.—p. 761.
*Subacute Bacterial Endocarditis after Operation for Tetralogy of Fallot. W. W. Hurst, A. L. Gleason and F. R. Schemm.—p. 763.
Postoperative Pancreatitis. D. Metheny and V. O. Lundmark.—p. 765.

Subacute Bacterial Endocarditis After Tetralogy of Fallot.—Hurst and his associates point out that the possibility of increasing the incidence of subacute bacterial endocarditis in patients with the tetralogy of Fallot has been advanced as an objection to the Blalock operation. They cite a case in which bacterial endocarditis developed two years after Blalock's operation had been performed. The endocarditis responded to treatment with penicillin. The effect of penicillin on the blood levels were satisfactory with hourly intramuscular injections, so that it was unnecessary to suppress the output of urine by restriction of fluids or the use of carinamide. A severe intercurrent throat infection appeared during the treatment with penicillin and this yielded only to sulfonamides. The authors feel that with close observation and prompt penicillin therapy the possibility of the development of subacute bacterial endocarditis after Blalock's operation is not a valid objection to that valuable procedure.

Ohio State Medical Journal, Columbus

45:1037-1143 (Nov.) 1949

Thromballosis. W. W. Weis.—p. 1061.
Streptomycin in Removal of Tuberculous Lung. M. G. Buckles and W. B. Neptune.—p. 1067.
Pre-Sacral Dermoid in Young Adult Male. E. A. Shorten and P. J. Fury.—p. 1069.
Toxic Reaction to Metycaine. A. Woodburn.—p. 1072.
Management of Appendiceal Abscesses. W. P. Montanus.—p. 1073.
Acute Cardiorespiratory Failure: Requirements for Successful Resuscitation. I. Introduction. C. S. Beck.—p. 1076.
Non-Surgical Management of Woman with Pelvic Cancer. L. A. Pomeroy.—p. 1077.
Contact-Systemic Penicillin Reactions Associated with Oral and Nasal Inhalators. L. C. Goldberg.—p. 1078.
Subluxation of Head of Radius in Children. E. E. Smith.—p. 1080.

Oklahoma State Medical Assn. Jour., Oklahoma City

42:465-506 (Nov.) 1949

Emotions Under a Microscope. C. C. Burlingame.—p. 468.
Trends in Treatment of Cancer of Bladder. M. A. Johnson.—p. 473.
Strabismus in Children. R. A. Clay.—p. 475.
Sympathectomy for Complications of Congenital Port-Wine Nevus. J. P. Wolff and H. A. Burnett.—p. 478.
Treatment of Fractures of Distal Third of Femur. J. A. Key.—p. 480.

Pediatrics, Springfield, Ill.

4:569-710 (Nov.) 1949

Immunologic and Biochemical Studies in Infants and Children with Special Reference to Rheumatic Fever: VII. Inhibition of Hyaluronidase by Sera. N. Epstein, R. L. Lubschez, P. F. de Gara and M. G. Wilson.—p. 569.
Id.: VIII. Response to Pituitary Adrenocorticotropic Hormone (ACTH). K. Hain and M. G. Wilson.—p. 579.
*Peritoneal Lavage in Treatment of Anuria in Children. H. Swan and H. H. Gordon.—p. 586.
*Acute Disseminated Histoplasmosis in Children: Report of Three Cases. J. H. Kneidel and H. Segall.—p. 596.
Methods Used in Treatment of Diarrhea with Potassium and Sodium Salts. J. Flett Jr., E. L. Pratt and D. C. Darrow.—p. 604.
*Essential Thrombocytopenic Purpura in the Newborn Infant: Report of First Case Treated by Splenectomy. S. S. Bluestone and H. L. Maslow.—p. 620.
Radioiodine Uptake Curve in Humans: II. Studies in Children. G. H. Lowrey, W. H. Beierwalters, I. Lampe and H. J. Gomberg—p. 627.
Penicillin Resistance of Nonhemolytic Streptococci from Rheumatic Children Receiving Prophylactic Penicillin. E. Krumwiede.—p. 634.
Hemophilus Influenzae Meningitis: Observations on Treatment of 110 Cases. W. G. Crock, B. R. Clanton and H. L. Hodes.—p. 643.
Persistence of Placentally Transmitted Toxoplasmic Antibodies in Normal Children in Relation to Diagnosis of Congenital Toxoplasmosis. A. B. Sabin and H. A. Feldman.—p. 660.
Myiasis Dermatosa in Infancy. S. Israels and B. Shuman.—p. 665.
Pediatrics and Child Psychiatry. A. Gesell.—p. 670.

Peritoneal Lavage in Anuria.—Swan and Gordon treated 3 children, 2 boys aged 3 and 8 years and a girl aged 9 months, who had acute anuria with peritoneal lavage for nine to fourteen days. Two additional patients with acute anuria, a girl aged 9 and a boy aged 4 from whom peritoneal lavage was withheld, are reported. The urine flow was restored by the peritoneal lavage in 2 patients, while failure with death occurred in the third. Different concentrations of dextrose in Tyrode's solution were used in the lavage. Dextrose is absorbed from the peritoneal lavage fluid in amounts which depend on the strength of the lavage solution. Water retention can be influenced by the concentration of dextrose in the solution. At 2 per cent dextrose, water was retained by the patient; at 4 per cent, water was lost by the patient. Peritoneal lavage is a complex and expensive, yet effective, method of partially stimulating the glomerulus of the kidney. The absence of tubular function in anuric patients who are receiving peritoneal lavage makes management of their acid-base balance a difficult problem.

Acute Disseminated Histoplasmosis.—Kneidel and Segall report 3 cases of acute disseminated histoplasmosis in 3 girls aged 3 years, 8 months and 9 months, respectively. The age incidence suggests that the disease is one of importance to the pediatrician. The onset of the illness could be traced back two or three months in all 3 cases. In 2 the active symptoms began with infection of the respiratory tract and persistent cough. The onset was insidious, with an intermittent fever, anorexia, lethargy and weight loss as predominant symptoms. All 3 patients had splenomegaly and hepatomegaly of a pronounced degree, and 2 had peripheral lymphadenopathy. Severe anemia and leukopenia was present in 3 patients. The platelet count was diminished, indicating a type of anemia secondary to bone marrow replacement. Histoplasma capsulatum was identified in the blood smear, in the bone marrow, in the biopsy of peripheral lymph nodes and through blood culture. Definitive evidence of disease in the chest was demonstrated on roentgenographic examination in only 1 patient. All the patients died, indicating that the prognosis is hopeless in a well developed case. No effective fungicide is as yet available to combat the disease.

Essential Thrombocytopenic Purpura.—Bluestone and Maslow report an instance of essential thrombocytopenic purpura in a newborn infant of a normal mother. The patient was delivered by difficult instrumental delivery after a normal pregnancy. The classic clinical and laboratory signs of the disease were noted on the second day of life. Splenectomy was performed on the ninth day of life because of continued bleeding into the skin and mucous membranes and the appearance of unilateral tremor. It was feared that the tremors were caused by intracranial bleeding. The infant made a complete recovery. It is the first case in which therapeutic splenectomy has been performed on a newborn infant with essential thrombocytopenic purpura. A newborn infant with this disease may be

expected to benefit from splenectomy only if the mother herself is free from the disease. The case lends support to the humoral theory of the pathogenesis of this disease.

Review of Gastroenterology, New York

16:809-886 (Nov.) 1949

Termination of Common Bile Duct. J. A. Sterling.—p. 821.
Biotoxic Conditions of Combined Type. A. Bassler.—p. 846.
Improved Esophagoscopy. A. R. Hufford.—p. 852.
*Report on Peptic Ulcer Therapy Using New Antacid. J. R. Reuling, A. X. Rossien and M. I. Welgel.—p. 856.

New Antacid in Therapy of Peptic Ulcer.—Reuling and his associates report observations on 22 patients in whom peptic ulcer had been proved by roentgenographic examination and who were treated over a twelve week period with the aluminum salt of aminoacetic acid. The patients were ambulatory but cooperated well. They were placed on a bland, high caloric and high vitamin diet and were instructed to take 1 Gm. of the antacid under study fifteen minutes before and fifteen minutes after each meal and before retiring throughout the twelve week observation period. Hunger pain, heartburn, belching, nausea, vomiting and abdominal pain were prominent symptoms in this group of patients. They obtained prompt relief from all these symptoms. Bowel activity was not influenced by the antacid. The average weight gain in the 17 patients who completed the three months' study was 2.5 pounds (1,134 Gm.). Eight of the 15 patients with chronic duodenal ulcer no longer presented an ulcer niche on roentgen study after three months' treatment. The authors feel that aluminum-dihydroxy-aminoacetate is a worthy adjunct in the treatment of peptic ulcers.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

57:397-452 (Sept.) 1949

Medical and Surgical Aspects of Pancreatic Obstruction and Inflammation. R. Elman.—p. 397.
Intractable Pruritus Vulvae et Ani Treatment by Alcohol Injection. W. M. Wilson.—p. 406.
Surgical Management of Infected Abortion. H. C. Falk and I. Abelow.—p. 419.
Fetal Meconium Peritonitis; Abscess; Intestinal Obstruction; Disappearance of Radiopaque Meconium Bodies. C. W. Brunkow, G. Nelson, S. Goodnight and others.—p. 424.
Pregnancy in Hodgkin's Disease. J. C. Brougher.—p. 430.

57:453-508 (Oct.) 1949

*Some Observations on Vascular Adjustments Following Interruption of Major Venous Channels. J. A. Gius.—p. 453.
Additional Experiences with Parotid Gland Tumors. D. V. Trueblood.—p. 463.
*Metycaine: Saddle Block Anesthesia in Obstetrics. H. G. Schluter and C. L. Cooley.—p. 469.
Simultaneous Tubal Abortion and Intrauterine Pregnancy. J. A. Culbertson, J. K. Afflerbaugh and E. H. Welch.—p. 474.
Interstitial Hydatid Mole with Spontaneous Perforation and Rupture of Uterine Cornu. H. A. Siegal and L. Rudolph.—p. 477.
Bee-Cell Pessary. C. G. Hutter.—p. 481.

Vascular Adjustment.—Gius reports 6 patients, 3 men and 3 women between the ages of 23 and 49, 2 of whom required interruption of important branches of the venous system for thromboembolic disease, while in the remaining 4 the principle of "en bloc" dissection of cancer of the breast, of the testicle and of the tongue and its area of lymphatic extension required removal of segments of adjacent major veins. Clinically there is a wide margin of safety, allowing for interruption of the inferior vena cava below the renal veins, the axillary veins and the jugular veins. Immediate edema appeared in all instances but regressed either completely or partially. Removal of a segment of a vein and surrounding structures, including collateral veins, as in operations for carcinoma, may result in serious decompensation of fluid exchange mechanisms. In the presence of thrombotic or inflammatory disease of the distal veins, some of the channels which might normally participate in the adjustments after ligation are probably involved by disease and/or spasm. Compensation, therefore, is likely to be incomplete after ligation, and permanent edema may follow. Interruption of a major channel may precipitate acute thrombosis of the distal circulation as a result of the sudden stagnation, even in the absence of antecedent disease of the vein wall. Such measures as elevation, compression, sympathetic block and anticoagulant drugs may be utilized to avert such complications.

Saddle Block Anesthesia.—Schluter and Cooley administered saddle block anesthesia to 1,000 patients who were admitted to Mary's Help Hospital in San Francisco for vaginal delivery. Seven hundred and seventy-four patients were given 2 cc. of a 1.5 per cent solution of piperocaine hydrochloride (metycaine®) in 10 per cent dextrose, and 226 patients were given 1 cc. of a 3 per cent solution of the same anesthetic in 5 per cent dextrose. Anesthesia was induced when labor was well established, the cervix dilating and the presenting part nearing the ischial spines. No injections were made during the uterine contractions. Nine hundred and fifty-five patients delivered experienced no pain whatsoever, while 982 delivered required no further anesthesia. Fifteen patients required additional anesthesia. The results in 3 patients were considered complete failures; 1 experienced no effect from the block, and the remaining 2 were so obese that the spinal needle could not reach the subarachnoid space. The average duration of anesthesia was 39 minutes in all cases. One injection was sufficient for delivery and repair of 984 patients, two injections were given to 13 patients and 1 patient was given three injections, yielding complete relief for six hours before delivery. Four hundred and nine patients delivered in less than 30 minutes, 478 delivered in 36 to 60 minutes, 29 delivered in 1 to 2 hours, 7 in 2 to 3 hours and another 7 delivered in 3 to 6 hours. Three hundred and fifty-three patients were blocked in the first stage of labor, and 647 patients were blocked in the early second stage of labor. Only 45 patients complained of any headache and these were all relieved with 10 grains (0.6 Gm.) of acetylsalicylic acid every four hours, while 15 patients required 1 grain (0.06 Gm.) of codeine for relief. The low incidence of postspinal headache was attributed to the careful technic in administration and the low toxicity of the drug. There was no increase in morbidity, and there were no fetal or maternal deaths which could be attributed to the anesthetic. There was no increase in the incidence of forceps delivery, and there was a striking decrease in the amount of immediate postpartum bleeding.

57:509-568 (Nov.) 1949

Extraperitoneal Cesarean Section: Physick-Sellheim Principle. E. W. Cartwright.—p. 509.
Physiologic Treatment of Poor Tone and Function of Genital Muscles and of Urinary Stress Incontinence. A. H. Kegel.—p. 527.
Branchiogenic Anomalies: Results of 70 Cases Observed at Johns Hopkins Hospital Between 1926 and 1946. G. E. Ward, J. W. Hendrick and R. G. Chambers.—p. 536.
*Postmastectomy Swelling of Arm with Note on Effect of Segmental Resection of Axillary Vein at Time of Radical Mastectomy. A. W. Lobb and H. N. Harkins.—p. 550.
Use of Male Rana Pipiens Frog in Diagnosis of Pregnancy and Differential Diagnosis of Abortions. E. C. Maier.—p. 558.

Postmastectomy Swelling of Arm.—Lobb and Harkins describe studies on the arm sizes of patients currently under the supervision of the King County Hospital Tumor Clinic of Seattle after having undergone mastectomy. An average of two or three measurements were made on each patient at interval visits. Arm measurements were made on 65 patients, but a detailed analysis was made only on 51 who had had a unilateral radical operation. In 41 of these 51, or 80 per cent, swelling of the homolateral arm developed after radical mastectomy. The authors regard this high percentage as noteworthy because surgeons and roentgenologists generally believe that only an occasional case of edema of the arm will occur after radical surgical intervention on the breast. Attention is usually drawn to this condition only when deformity and impairment of function exist. The authors found only one other report in the literature in which systematic measurements were made. The postmastectomy swelling of the arm is usually slight. Only 11 of the 51 patients investigated by the authors had an increase in arm circumference of more than 3 cm. Wound infection has been regarded by some as the causative factor, but in this series there seemed to be no correlation with either wound infection, skin grafting or axillary metastases. When indicated in order to remove adherent carcinomatous lymph nodes, the axillary vein should not be spared because of the possibility of arm swelling. Segmental excision of the axillary vein caused little swelling of the arm. Severe swelling was noted in only 1 of 4 patients, and then only the forearm was affected.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

30:237-364 (Aug.) 1949. Partial Index

Studies on Factor in Normal Allantoic Fluid Inhibiting Influenza Virus Haemagglutination. A. Svedmyr.—p. 237.
Experimental Liver Cirrhosis in Rats Produced by Prolonged Subcutaneous Administration of Solutions of Tannic Acid. B. Korpássy and K. Kovács.—p. 266.
Kaolin-Adsorption Method for Quantitative Assay of Urinary Gonadotrophins. J. Dekanski.—p. 272.
Tissue Response to Heat-Killed Streptococci in Skin of Normal Subjects, and in Persons with Rheumatic Fever, Rheumatoid Arthritis, Subacute Bacterial Endocarditis and Erythema Nodosum. J. H. Humphrey and W. Pagel.—p. 282.
Quantitative Studies in Diphtheria Prophylaxis: Primary Response. L. B. Holt.—p. 289.
Antibiotics from Strain of B. Subtilis: Bacilipin A and B and Bacilysin. G. G. F. Newton.—p. 306.
Fixation of Diphtheria Toxin to Skin Tissue with Special Reference to Action of Circulating Antitoxin. A. A. Miles.—p. 319.

British Medical Journal, London

2:941-1000 (Oct. 29) 1949

Individuality in Medicine. G. Marshall.—p. 941.
I. P. Pavlov. J. Konorski.—p. 944.
Penicillin in Subacute Bacterial Endocarditis. R. V. Christie.—p. 950.
Sudden Obesity and Psychological Trauma. H. J. Shorvon and J. S. Richardson.—p. 951.
Upper-Limb Pain Due to Lesions of Thoracic Outlet: Scalenus Syndrome, Cervical Rib and Costoclavicular Compression. L. Rogers. —p. 956.
Comparative Merits of Sodium and Procaine Penicillin Given Infrequently. E. Griffiths, P. F. Jones, R. A. Shooter and J. A. Heady. —p. 958.
"Neo-Epimine" in Dyspnoea of Coal-Miners. C. K. Robertson.—p. 961.
Rectal Haemorrhage Associated with Infectious Mononucleosis. P. Eckstein and A. L. P. Peeney.—p. 962.
Dissecting Aneurysm of Aorta Simulating Embolism at Aortic Bifurcation. H. S. Shucksmith and I. Macpherson.—p. 963.

2:1001-1064 (Nov. 5) 1949

*Liver Damage Produced by Feeding Alcohol or Sugar and Its Prevention by Choline. C. H. Best, W. S. Hartroft, C. C. Lucas and J. H. Ridout.—p. 1001.
Pre-Erythrocytic Stage of Plasmodium Falciparum: Preliminary Note. H. E. Shortt, N. H. Fairley, G. Covell and others.—p. 1006.
Rehabilitation and Resettlement of Tuberculous. F. Heaf.—p. 1008.
Prostatic Obstruction. H. H. Stewart.—p. 1011.
Multiple Myeloma: Note on 8 Cases. D. P. Degenhardt and D. Sheehan.—p. 1016.
Fatal Poisoning of Infant by Anti-Anaemic Pills Containing Iron, Manganese, and Copper. J. H. Prain.—p. 1019.
Synovial Osteochondromatosis: Two Uncommon Examples. J. F. Corr. —p. 1020.
Study in Visual Defects in Young Children. P. A. Tyser and T. W. Letchworth.—p. 1022.
Acute Adrenal Insufficiency after Adrenalectomy for Pre-Pubertal Virilism. B. V. Jones.—p. 1023.

Liver Damage from Alcohol or Sugar.—Best and his associates used isocaloric pair-feeding in their study on the effects of alcohol on the liver. Groups of rats not receiving alcohol were isocalorically pair-fed with those ingesting alcohol. The extra calories (equivalent to those supplied by the alcohol) were provided in the form of finely powdered sucrose. The effects of various lipotropic supplements added to the diets of the rats consuming alcohol were studied. The pathologic changes in the liver produced in these experiments are attributed to an imbalance of calories and vitamins, particularly to an induced inadequacy of lipotropic factors consequent on the increased caloric intake. Adequate amounts of choline chloride, methionine or casein always protected the liver. Under these particular experimental conditions there is no more evidence that there is a toxic effect of pure alcohol on the liver cells than there is of a poisonous action of an amount of sucrose which supplies the same caloric intake. In fact, there is no suggestion that either alcohol or sucrose exerts a direct hepatotoxic effect. The fatty and fibrotic changes are due to a deficiency of the lipotropic factors. The authors mention the proposal to supplement alcoholic beverages and saccharine aerated water ("soft drinks") with choline or its precursors. They admit that their observations are not necessarily applicable to alcoholism in human subjects. If they should prove to be so, it is obvious that persons who habitually consume large amounts of alcohol or sugar lack adequate amounts of the lipotropic agents as well as of other dietary essentials. The classic hepatic lesions (fatty changes and fibrosis) associated with alcoholism in human subjects may prove to be due specifically to a lack of the lipotropic agents.

Edinburgh Medical Journal

56:337-380 (Aug.) 1949

Influenza in Perspective. C. H. Andrewes.—p. 337.
Factors That Commonly Worry Patient in Hospital. R. H. Girdwood and M. B. Ballinger.—p. 347.
Haematological Standards: Edinburgh 1949. E. B. Hendry.—p. 353.
Pneumococcal Infections. J. T. Smeall.—p. 359.
Acroparaesthesia—Idiopathic Myalgia of Elbow. M. G. Good.—p. 366.

Journal of Hygiene, London

47:107-220 (June) 1949. Partial Index

Qualitative Differences Among Toxins and Toxoids. M. Barr and A. T. Glenny.—p. 107.
Experimental Study of Haemolytic Disease of the Newborn Due to Isoimmunization of Pregnancy: I. Attempt to Produce Syndrome in Rabbit. D. H. Heard, I. T. Hinde and L. S. Mynors.—p. 119.
Coagulation Phenomenon: V. Further Experiments on Importance of Choice of Complement When Examining Antisera for Presence of Complement-Fixing or Complement-Absorbing Antibodies. A. M. Blomfield, R. R. A. Coombs and N. H. Hole.—p. 132.
Inhibition of Bacterial Growth by Pure Ozone in Presence of Nutrients. M. Ingram and R. B. Haines.—p. 146.
Epidemic of Infantile Gastro-Enteritis in Queensland Caused by Salmonella Boris-Morbificans (Basenau). I. M. Mackerras and M. J. Mackerras.—p. 166.
Housing of Laboratory Animals. J. I. M. Jones and E. C. Wood. —p. 190.
Feeding and Breeding of Laboratory Animals: IX. Complete Cubed Diet for Mice and Rats. H. M. Bruce and A. S. Parkes.—p. 202.
Source of Infection in Pemphigus Neonatorum. M. T. Parker and J. Kennedy.—p. 213.

Lancet, London

2:869-924 (Nov. 12) 1949

*Maternal Obesity. J. H. Sheldon.—p. 869.
Health of Nurses in Hospital. D. Court.—p. 874.
Neurological Effects of Oxygen in Chronic Cor Pulmonale. C. E. Davies and J. Mackinnon.—p. 883.
*Streptomycin in Human Tuberculosis: Study of 47 Cases. P. V. Karamchandani, R. Ramachandran, S. R. Kidiyoor and others.—p. 886.
Screening Test of Chemical Compounds for Pituitary Adrenocorticotropic Hormone Activity. T. D. Spies and T. E. Stone.—p. 890.
Partial Retention of Autonomic Function After Paravertebral Sympathectomy (Intermediate Lumbar Sympathetic Ganglia as Probable Explanation). J. D. Boyd and F. A. G. Monro.—p. 892.

Maternal Obesity.—Sheldon studied 40 women (with a total of 109 children) who had become obese during pregnancy or after delivery, while for control purposes 40 women (with a total of 119 children) who had not gained weight after delivery were studied. The maximum weight reached was 125 per cent above that on marriage. The increase might begin either during pregnancy or immediately after confinement and might occur after all pregnancies or after only one pregnancy—often when the baby was a boy. In typical cases there was an extremely rapid initial gain of weight followed by a static phase when the weight remained at its new level for an indefinite period, though occasionally there was a later fall. Abnormal pregnancy was somewhat more frequent than in the controls, menstruation was unaffected and lactation was normal, though in some cases there was an excess of milk. In later life abnormalities of carbohydrate metabolism developed in some of these women and 2 were diabetic. The stillbirth and neonatal mortality was increased, and the women produced a large number of large babies, which were, however, born almost entirely to those women who became obese in the course of each pregnancy. Small babies were, by contrast, confined to those women who became fat after confinement from a particular pregnancy. Their mothers had suffered from the same condition more frequently than normal, though their sisters were not specially affected, and they themselves showed a tendency to have been unusually large babies at birth. Though an increased anterior pituitary function could account for the large babies, the raised fetal death rate, excess lactation and subsequent diabetes, it is not felt that the obesity can be so easily explained. It is therefore suggested that this may be due to a hypothalamic disturbance, which produces an obesity similar to that which follows experimental injury to the hypothalamus and in some cases also causes a disturbance of anterior pituitary function, leading to the "large baby, diabetic syndrome."

Streptomycin in Human Tuberculosis.—Karamchandani and co-workers present observations on 47 patients with tuberculosis whom they treated with streptomycin. They divide their patients into 6 groups: group I exudative, group II pneumonic, group III fibrocaseous, group IV intestinal, group V pleural in addition to pulmonary and group VI miliary (acute and chronic). A favorable response occurred in 11 of the 27 cases in group I, in 2 of the 4 cases in group II, in none of the 3 in group III, in all of the 5 in group IV, in 3 of the 4 in group V, in the 1 acute case in group VI and in 2 of the 3 chronic cases in group VI. The authors state that streptomycin does good in all types of cases in which no irreversible changes have taken place. Women seemed to respond better than men, and patients of 40 years or more responded less favorably than younger persons. One gram per day, divided in 2 doses of 0.5 Gm., morning and evening seemed the most advantageous dosage. No untoward effects requiring special treatment were noted; a few patients complained of giddiness during the earlier stages of treatment. The only measure adopted to combat it was suspension of treatment for a while. Administration of other treatments during the course of streptomycin is not contraindicated but does not seem to result in additional benefit. Para-aminosalicylic acid was tried in 1 case without advantage. A total dose of 11 Gm. was the smallest amount that proved of benefit in this series. It is felt that the best method is administration of streptomycin during the critical stage and, once the toxemia has been controlled, changing to other methods of treatment. The dosage of streptomycin required differs from patient to patient.

Medical Journal of Australia, Sydney

2:481-520 (Oct. 1) 1949

Studies on Epidemiology of 1947-1948 Epidemic of Poliomyelitis in South Australia. R. V. Southcott, N. D. Crosby and N. S. Stenhouse.—p. 481.
Impediments to Progress in Medical Education. E. S. Meyers.—p. 496.
*Variants of Rh Type: Interesting Family Study of Rh Gene Allelomorphic to D. A. M. Delaney.—p. 500.
Syphilis Resurgens. E. H. Molesworth.—p. 502.

Variants of Rh Type.—Delaney describes an interesting family study of an Rh gene allelomorphic to D. A feature which became evident during this investigation was the necessity and value of availability of cells from persons of known genotype. The Rh" and homozygous Rh_0 test cells proved to be most useful in this particular study. The author feels that it is essential that any anti-Rh serum discovered be forwarded to a central laboratory suitably equipped to ascertain the antibodies present in the serum. This laboratory can then direct the serum into the most useful channels for the maintenance of supply, for which there is an ever increasing demand. The author describes an example of the D^u variant of the D (Rh_0) antigen in human red cells. It is of interest because it is the first report of such a variant in Australia and because of the interesting family tree. The genealogy is described, and the part played by D^u in the Rh system is discussed.

2:521-552 (Oct. 8) 1949

*Renal Regulation of Extracellular Fluid: I. Study of Homoeostasis in Patient with Duodenal Fistula. D. A. Denton.—p. 521.
Rheumatoid Arthritis and Monarticular Trauma. M. Kelly.—p. 528.
Epidural Injection of Hypertonic Sodium Chloride Solution in Treatment of Sciatica and Other Root Pains in Lower Limb. J. H. Young.—p. 530.
*Chronic Non-Suppurative Hepatitis: Some Observations with Special Reference to Diagnosis, Management and Prognosis. W. E. King, R. Motteram, S. Weiden and I. J. Wood.—p. 532.
Non-Keratinous Constituents of Hair. A. Bolliger.—p. 536.
*Case of Severe Tetanus Treated with Continuous Intravenous Infusion of "Myanesin" and "Sodium Pentothal." W. B. Mcdonald.—p. 538.

Renal Regulation of Extracellular Fluid in a Patient with Duodenal Fistula.—According to Denton, the kidney controls homeostasis of the nonvolatile substances in the extracellular fluid. This was demonstrated in a young man, aged 17, with a duodenal fistula which developed after a partial gastrectomy performed for a bleeding duodenal ulcer. The fluid of the fistula contained twice as much sodium ion (Na^+) as chloride ion (Cl^-). The loss of 2 to 4 liters of this fluid daily would obviously tend to lower the level of sodium ion in the extracellular fluid at a greater rate than the chloride ion. The ratio of these ions in the extracellular fluid of this patient remained approximately constant. The kidney maintained this homeostasis by excreting a sufficient excess of chloride ion relative to sodium ion. The kidney did this despite the fact that the level of chloride in the plasma was constantly depleted below the renal threshold for this ion. A duodenal fistula of postgastrectomy type represents an experimental technic for studying the renal regulation of electrolytes, when twice as much sodium ion as chloride ion is subtracted from the body. An important feature of this technic is that there is a functioning gastrojejunostomy, making possible the free absorption of water and food from the intestines. Biochemical observations were made over the forty-five day period during which the patient remained alive after development of the fistula. It is possible that either the hydrogen ion concentration of plasma or the chloride:sodium ratio of the glomerular filtrate is a factor acting at the renal tubular level to determine the excretion of chloride. It is probable that renal tubular behavior towards the chloride ion should be considered relative to the stress which the experimental technic used places on the sodium ion. Marriott's suggested use of the Fantus test for diagnosing ion depletion is not completely reliable when sodium is lost from the body in excess of chloride.

Chronic Nonsuppurative Hepatitis.—King and co-workers report 14 cases of chronic hepatitis probably due to virus infection in 6 males and 8 females between the ages of 13 and 58 years. The patients were studied by clinical observation, liver function tests and aspiration biopsy of the liver over a period of three years. During this period 7 of the 14 patients died from hepatic failure usually after hematemesis or a superimposed acute infection. The illness began with a definite acute attack of hepatitis in 12 patients; the onset was insidious in the remaining 2. The course varied considerably. Deep jaundice and cachexia persisted for over three months in the severe nonremittent type of infection. Attacks of jaundice recurred several months after the initial illness in the chronic relapsing type. Chronic ill health, jaundice and splenomegaly were the outstanding symptoms and signs in the chronic phase. The liver was usually palpable. Ascites and massive hemorrhage, especially hematemesis, were of serious import. The most valuable chemical tests were estimation of the albumin-globulin ratio, the cephalin flocculation test, the alkaline phosphatase estimation and the serum bilirubin test. Aspiration biopsy of the liver was of value in indicating the presence and severity of the hepatitis. It also aided in excluding other forms of hepatitis, notably nutritional disease of the liver and biliary cirrhosis. There is no specific treatment for chronic hepatitis. Diet, limitation of physical exertion and the energetic treatment of superimposed infections are of value. Hepatic failure should be treated by the intravenous drip administration of dextrose and isotonic sodium chloride solution, serum and blood as indicated.

Mephenesin and Thiopental Sodium in Tetanus.—Macdonald reports 1 boy aged 11 years with severe tetanus. The continuous generalized spasms of the patient could not be influenced by heavy sedation with paraldehyde and amobarbital sodium (amytal sodium®). The spasms lasted twenty-three days before intravenous therapy could be discontinued. Single intravenous injections of mephenesin (myanesin,® 3-ortho-toloxy-1,2-propanediol) controlled the spasms for only ten minutes. Combined treatment with 1 Gm. of mephenesin and 0.75 Gm. of thiopental sodium (pentothal sodium®) per 600 cc. of infusion fluid, approximately 60 cc. per hour given continuously by intravenous infusion, controlled the spasms. Immediate recurrence of severe spasms demonstrated the inefficacy of thiopental sodium alone when mephenesin was withheld on the fourth day of this treatment. The main advantages of this method of treatment are the ease with which the patient can be nursed adequately and the simplicity and rapidity with which severe spasms can be controlled. There was no clinical or biochemical evidence of any ill effects from the continued use of large doses of thiopental sodium for twenty days, and of mephenesin for eleven days, apart from local venous thrombosis. The absence of complications was probably due to the administration of mephenesin in weak dilution.

Acta Medica Scandinavica, Stockholm

135:221-302 (Sept. 26) 1949. **Partial Index**

Investigations on Bone Chemistry of Man: I. Ash Content of Spongy Substance of Iliac Crest. J. H. Vogt.—p. 221.
*Trauma and Rheumatoid Arthritis. E. Jonsson and K. Berglund. —p. 255.
Malignant Primary Nephrosclerosis in Series of Hospital Patients. S. G. Jokipii.—p. 263.
Relationship of Anterior Pituitary Gland to Diabetes Mellitus. F. G. Young.—p. 275.
*Further Experiences in Treatment of Experimental Tuberculous Infection in White Mice with Para-Aminosalicylic Acid (PAS) Employing Chemosensitive and Chemoresistant Strains of Tubercle Bacilli. B. Swedberg.—p. 289.

Trauma and Rheumatoid Arthritis.—Most investigators feel that polyarthritis can be produced by trauma. Jonsson and Berglund found, among 2,236 patients with rheumatoid arthritis, only 12 with a history of trauma. The acceptance of a relationship between trauma and rheumatoid arthritis requires the fulfilment of the following conditions: 1. The patient should not previously have had rheumatoid arthritis. 2. No previous injury to the joint should have occurred. 3. The trauma must have involved the joint, and symptoms must have begun almost immediately. 4. The joint injury must have shown symptoms up to the start of the rheumatoid arthritis. 5. The interval between the injury and the onset of the rheumatoid arthritis should not be too long. 6. The diagnosis of rheumatoid arthritis should be definite. A critical examination of all the cases suggests that only 1 case in 2,236 fulfils all these conditions. This ratio hardly supports the idea that trauma plays an appreciable role. It may be difficult, however, to disregard the possibility of trauma as a contributing cause to rheumatoid arthritis.

Para-Aminosalicylic Acid in Experimental Tuberculosis.—Swedberg fed para-aminosalicylic acid (PAS) to mice in drinking water. Blood concentrations of up to 9 mg. per hundred cubic centimeters could be achieved with this method by a daily administration of about 50 mg. of PAS per mouse. Mice not infected tolerated this dose for two months without loss of weight or spontaneous death. With a daily dose of 5 mg. of PAS per mouse the blood concentrations varied up to 2 mg. per hundred cubic centimeters. Ten strains of tubercle bacilli with varying sensitivity to PAS in vitro were chosen for the first experiment. All mice in the treated groups were treated until their spontaneous death. Death was considered due to tuberculosis if necropsy showed extensive tuberculosis of the lungs. A stastistically significant therapeutic result was obtained in all sensitive strains but one. No therapeutic results were obtained in any of the relatively or absolutely PAS-resistant strains. Smaller infectious doses were used in a second experiment in which the dose of PAS was made 10 times higher than in the first experiment. Three sensitive and three resistant strains were tried. The scatter among the untreated control groups makes statistical evaluation of the therapeutic results impossible, but the difference between the mean survival time for control and treated groups is greater for the sensitive strains. All mice, however, died of massive tuberculosis, and cure was not obtained in any instance. The therapeutic results with streptomycin (1,000 units once daily) were much more apparent.

Archives des Maladies du Coeur, Paris

42:573-668 (June) 1949. **Partial Index**

Roentgenologic Signs of Stenosis of Aortic Isthmus. P. Soulié, P. Chiche and R. Tricot.—p. 573.
*Value of Ether Test in Diagnosis of Venous-Arterial Shunt: Results in 500 Cases of Congenital Cardiopathy. E. Donzelot and co-workers. —p. 601.

Ether Test in Diagnosis of Venous-Arterial Shunt.—Donzelot and co-workers performed the ether test of Hittzig and Benenson on 500 patients between the ages of 1 and 45 years with congenital heart disease. Three hundred and fifteen of these patients (63 per cent) had tetralogy of Fallot. The amount of ether injected into the antecubital vein or into the external jugular vein in small children varied from 0.03 cc. to 0.5 cc. The reaction to the test was positive in 84 per cent of the patients tested and negative in 16 per cent. Seventy-five per cent of the tests which elicited positive reactions were performed on patients with tetralogy of Fallot. A positive reaction to the ether test is pathognomonic of a venous-arterial shunt, or at least of a mixed shunt. A negative reaction to the test presents reliable proof of the absence of the shunt. The existence of the shunt was verified in 27 instances by necropsy. Angiographic examination was performed in 102 instances, and it confirmed the existence of the shunt in 75 instances in which the reaction to the ether test was positive and the absence of the shunt in 27 instances in which the reaction was negative. The results of the ether test were confirmed by surgical intervention in 129 instances. The ether test is of considerable value in the diagnosis of congenital heart disease in patients without cyanosis or with doubtful or late cyanosis. It also is of value in the diagnosis of Eisenmenger's syndrome and in the differential diagnosis of either Roger's disease or interauricular communication. The test should be made systematically on all patients with congenital heart disease as an aid in the diagnosis of the arteriovenous shunt.

Maandschrift voor Kindergeneeskunde, Leyden

17:163-194 (No. 6) 1949

Tetanus Neonatorum. J. H. de Haas.—p. 163.
*Primary Atypical Virus Pneumonia in Children. D. P. R. Keizer. —p. 172.
Death Resulting from Poisoning with Sulfonamides. S. Kian.—p. 190.

Primary Atypical Virus Pneumonia in Children.—Keizer discusses the clinical aspects and complications of virus pneumonia on the basis of observations on 41 children. The insidious onset is noteworthy. Roentgenographic examination is of diagnostic value. The cold agglutination is not specific but is of help after hepatic and other diseases have been excluded. Repeated determination of the cold agglutination titer is of diagnostic and prognostic value. Although the mortality rate is zero, virus pneumonia is fairly serious in children because of such complications as hemolytic anemia, hepatitis, acute hemorrhagic nephritis, myocarditis, endocarditis, encephalitis, benign reticulosis, acute suprarenal insufficiency, mastoiditis, sinusitis and the exanthems. Sulfonamides and penicillin counteract secondary infections only, and their use involves the risk of anemia. Gamma globulin in doses of 0.2 cc. per kilogram of body weight helped in some cases but did not always prevent relapse and complications.

Medicina, Buenos Aires

9:241-312 (Aug.) 1949. **Partial Index**

*Circulation and Respiration in Erythremia. A. C. Taquini, J. R. E. Suárez and A. Villamil.—p. 241.
*Thiouracil in Therapy of Hyperthyroidism. E. B. del Castillo and A. J. Bengolea.—p. 278.

Circulation and Respiration in Erythremia.—Taquini and his collaborators made observations on 4 patients with erythremia. The oxygen content in the arterial blood was increased in all 4 cases. The oxygen pressure in the arterial blood, the minute volume and the function of the left ventricle were normal. The type of circulation in erythremia is explained by the dilatation of the arteriocapillary bed, which counterbalances the effect caused by the increased viscosity of the blood. The basal metabolism was increased. Arterialization of the pulmonary blood was greatly increased.

Thiouracil Derivatives in Hyperthyroidism.—Castillo and Bengolea report on thiouracil therapy in toxic goiter. The drug was used as a preoperative measure in 300 cases, and as the sole medical treatment in several hundreds of patients over a period of five years. As a preoperative medication the drug was given in daily doses of 200 or 300 mg. of propylthiouracil or 200 to 400 mg. of methylthiouracil. The daily dose was reduced to 100 mg. of propylthiouracil or to 100 mg. of methylthiouracil when the basal metabolism was lowered to one-half the figure of the initial determination. When the patient appeared normal the antithyroid therapy was discontinued and the patient was given 10 drops of strong iodine solution three times daily for three weeks, at the end of which period the operation was performed. Medically treated patients were given 25 to 50 mg. or propylthiouracil or 50 to 100 mg. of methylthiouracil daily for one year, after which the same dose was given every other day for six months. No recurrence took place in any of the patients observed for over two years.

Nordisk Medicin, Stockholm

41:1623-1654 (Oct. 14) 1949. Partial Index

*Treatment with Crystalline Estradiol Benzoate (Follicyclin B) in Functional Disturbance in Menopause and After Castration. N. O. Karlén.—p. 1628.
*Ureterolithiasis and Its Prognosis. B. Landaas.—p. 1635.
Erythromyelosis Maligna (di Guglielmo's Disease). J. Hoel.—p. 1638.
Acute Hemolytic Anemia (Lederer's Anemia). B. Merrild-Hansen. —p. 1641.

Treatment with Crystalline Estradiol Benzoate (Follicyclin B) in Functional Disturbances in Menopause and after Castration.—Karlén found that injection of 10 mg. of crystalline estradiol monobenzoate in patients with functional disorders after bilateral oophorectomy with hysterectomy (11 cases), after bilateral oophorectomy in the childbearing period (4 cases) and in menopause (10 cases) resulted in decided improvement in the symptoms. Recurrence within two weeks was seen in only 1 patient. The other patients were free from symptoms for at least two weeks and in more than half the cases for at least one month. In 1 case the disturbance disappeared after one injection. In 9 patients conspicuous improvement lasted for two to ten weeks. In 15 cases there were definite individual differences in the effect of the injection. Follicular hormone titration demonstrated that the substance can exert an endocrine effect for at least a month. In most cases in which the menopause had begun less than two years before the treatment, minor hemorrhages occurred; the treatment is thought possibly to have been a contributing cause. Depot treatment is probably inadvisable before the menopause. The main indication for treatment with crystalline estradiol benzoate is in functional disturbances in patients who have undergone hysterectomy and patients previously given radium treatment because of functional hemorrhages. It is also advantageous in young women after castration and in women one or two years in the menopause. The treatment must be carried out with care and with regard to the possible risk of hemorrhage. The injection should not be given oftener than once a month and must be discontinued in case of hemorrhage.

Ureterolithiasis and Its Prognosis.—Landaas states that in the 162 patients (119 men and 43 women) with ureterolithiasis treated in Aker Hospital from 1930 to 1940, the ureteral calculus was demonstrated roentgenographically and was passed spontaneously during hospitalization or shortly after discharge. Ten patients have died, the cause of death in only 1 case being due to infection of the urinary tract. The first attack of ureterolithiasis in most patients occurred between the ages of 20 and 45. Calculi were more frequent in the right ureter than the left; bilateral calculi were found in one instance. There was hematuria in 146 cases and pyuria in 24. In 2 cases congenital anomalies of the urinary tract were present. Questionnaires were answered by 135 patients. The average observation period after discharge was 11.3 years. Recurrence was reported in 44 cases (30.7 per cent), in 19 of these after more than five years' free interval; 24 patients had one recurrence, and 17 had three or more recurrences. Renal calculi developed in 2 patients eight and ten years, respectively, after the first attack of ureterolithiasis. Attacks of ureteral calculi often occur in patients with renal calculi, but the reverse is rare. Recurrence of renal calculi is far more common than recurrence of ureteral stones. Sharper distinction between renal calculi and ureteral calculi is necessary because they differ both as to etiology and prognosis.

Presse Médicale, Paris

57:849-868 (Sept. 28) 1949. Partial Index

Rôle of Ribonucleic Acid in Development of Cancer Cells in Relation to Therapy. L. Corail and A. Stahl.—p. 849.
Question: Whether Certain Strains of Mycobacterium Paratuberculosis Are Absolutely Nonvirulent. C. Levaditi, A. Vaisman and P. Lévy.—p. 852.
*Puncture Biopsy of Liver During Miliary Tuberculosis. M. Janbon, P. Cazal and L. Bertrand.—p. 854.

Biopsy of Liver in Miliary Tuberculosis.—Janbon and co-workers performed 45 puncture biopsies of the liver in 24 of 48 patients with miliary tuberculosis. Microscopic examination of liver tissue did not show any tuberculous lesions in patients whose roentgen pictures showed pulmonary ulceration and who had many Koch's bacilli in the sputum. Tuberculous changes in liver tissue were always observed in patients who did not show any ulcerating lesions on roentgenographic examination of the lung. The liver was normal in patients with cavitary miliary tuberculosis. Patients of the first group presented rise of temperature and frequently had simultaneous or secondary meningitis. They had hematogenous miliary tuberculosis. The temperature was near to normal or occasionally normal in patients of the second group, in whom secondary meningitis was an exception. The patients of this latter group had localized bronchogenic miliary tuberculosis, the prognosis of which is more favorable. Puncture biopsy of the liver thus becomes a valuable aid in differential diagnosis between miliary tuberculosis of the hematogenous type, with tubercles in the liver in the absence of loss of pulmonary substance, and pulmonary miliary tuberculosis in patients with cavities in the absence of specific lesions of the liver (bronchogenic miliary tuberculosis). In addition, puncture biopsy of the liver may be an aid in establishing the prognosis. Repeated puncture biopsies of the liver made it possible to evaluate the effect of streptomycin therapy on the patients with hematogenous miliary tuberculosis. The histiocyte elements of the tubercle in the liver tissue undergo fibrosis and hyalinosis, and finally the tubercle becomes completely sclerosed. Not all the tubercles follow the same course; totally cicatrized lesions coexist with active tubercles. Cicatrized lesions appear usually about the third month of streptomycin treatment, and they may disappear completely after more than five months of treatment. It seems advisable to continue the treatment until a complete cure of the microscopic lesions of the liver has been achieved, but a secondary meningitis may develop in spite of this precaution. A near to normal hepatic parenchyma was observed on necropsy in 2 cases of miliary tuberculosis which had been established by puncture biopsy of the liver and in which death had resulted from meningitis after prolonged treatment with streptomycin.

Wiener klinische Wochenschrift, Vienna

61:655-670 (Oct. 14) 1949. Partial Index

*Treatment of Bacterial Endocarditis. K. Fellinger.—p. 655.
Peculiar Vascular Changes in Lung ("Anastomositis"). L. Kuczko. —p. 659.
Vital Indications for Streptomycin Therapy in Bronchogenic Forms of Pulmonary Tuberculosis and in Acute Empyema. G. Berger.—p. 660.

Treatment of Bacterial Endocarditis.—According to Fellinger, cure of endocarditis, but not of the defect of the cardiac valves, may be obtained with penicillin in about two thirds of the cases of acute and subacute bacterial endocarditis. Removal of focal infections should be carried out before or simultaneously with an effective course of penicillin. One to two million units of penicillin in aqueous solution should be given daily, divided into three hour doses, by intramuscular route for one week or ten days. Treatment may then be continued for two weeks with 500,000 to 600,000 units daily and then with 200,000 to 400,000 units for several additional weeks. An average treatment period of four to six weeks will be sufficient in favorable cases, but much longer periods of treatment may be required. The occurrence of a penicillin-resistant strain of Streptococcus should not prevent a trial with penicillin, since the relationship between clinical responsiveness of bacteria and bacteriologic sensitivity to penicillin is not always unequivocal. Initiation of the treatment with sufficiently high doses of the antibiotic is of the greatest importance. Improvement may result within the first days of the treatment. Recovery is manifested by a normal temperature for several months, reduced blood sedimentation rate, normalization of leukocytes and diminution in the size of the spleen. Recurrences may be prevented by three repeated two week courses of penicillin at four week intervals. Combined treatment with penicillin and sulfamethazine in doses of 6 Gm. daily by mouth for ten days proved to be more effective than penicillin alone in some cases. A daily dose of 1.5 to 2 Gm. of streptomycin in four divided doses, with a total dose of 20 to 30 Gm. of the drug, was effective in a few penicillin-resistant cases. Treatment with penicillin combined with splenectomy may be indicated in patients who respond well to penicillin but have recurrences as soon as penicillin is discontinued.

Book Notices

THE REVIEWS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES AND DO NOT REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED.

Atomic Medicine. Edited by Capt. Charles F. Behrens, (MC) United States Navy, Director, Atomic Defense Division, Bureau of Medicine and Surgery, Navy Department, Bethesda, Md. Cloth. $7.50. Pp. 410, with illustrations. Thos. Nelson & Sons, 385 Madison Ave., New York 17; Parkside Works, Dalkeith Road, Edinburgh 9; 3 Henrietta St., London, W.C., 2, 1949.

Capt. C. F. Behrens is to be congratulated for bringing together "the first text on atomic medicine written in the atomic age." The editors are authorities in their field, and they have provided for physicians everywhere a concise summary of available knowledge on this subject.

The twenty-one chapters include the entire scope and general background of atomic medicine, from fundamental physics to the uses of radioactive isotopes in diagnosis and treatment. The design and operation of laboratories employing radioactive isotopes in medical research are thoroughly discussed, as are radiologic safety and atomic disaster planning. Not only should this book be in the library of every physician, whether he is interested in research or clinical medicine, but it should be read in order that he may be informed about the various possibilities in atomic warfare and the means to care for the community in the event of an atomic bomb disaster.

The publishers are to be congratulated on the manner in which the material is presented. The print is good, the paper and illustrations are excellent.

Factors of Evolution: The Theory of Stabilizing Selection. By I. I. Schmalhausen. Translated by Isador Dordick, Department of Geography, the Johns Hopkins University, Baltimore, Md. Edited by Theodosius Dobzhansky, Department of Zoology, Columbia University, New York. Cloth. Price, $6. Pp. 327, with 42 illustrations. The Blakiston Company, Division of Doubleday & Company, Inc., 1012 Walnut St., Philadelphia 5; Toronto 2, 1949.

The author advances a synthetic treatment of evolution on a basis of comparative embryology, comparative anatomy and a broad understanding of the mechanics of development. The theory that the struggle for existence is always associated with destruction of less viable, less well adapted persons and at times with destruction of entire populations or species is discussed. The author indicates the importance of natural selection as a factor leading toward creation of more integrated forms of organization. Differences between mobile and conserving forces of natural selection are discussed. Fundamental processes involved in the transformation of the individual organism during its historic development are related in considerable detail, and special emphasis is placed on the processes involved in the accumulation of reserves of variability from the genetic viewpoint.

The author served as director of the Institute of Evolutionary Morphology and was a member of the Academy of Sciences of the USSR until he was expelled because of a stated failure to recognize in this volume the findings or recent interpretations of genetics now officially approved in the USSR.

Neoplasms of the Dog. By R. M. Mulligan, M.D., Professor of Pathology in the University of Colorado Medical Center School of Medicine. Cloth. $4. Pp. 135, with 59 plates. The Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1949.

For many years Dr. Mulligan and some of his veterinary colleagues have collected spontaneous tumors occurring in dogs. This well written book is a description of 1,000 tumors so observed. Approximately one-half the tumors were malignant, and these were about equally divided between carcinomas and sarcomas. Carcinoma was most frequently found in the mammary glands and skin. Curiously, the most frequent type of sarcoma was that involving mast cells. A good bibliography and a technical supplement are included. The photomicrographs are of excellent quality and are generously provided.

This is one of those small monographs that arises from years of personal work in some specialized field providing useful knowledge that could not have been attained in any other way.

Radiologic Exploration of the Bronchus. By S. di Rienzo, M.D., Assistant Professor of Radiology and Physiotherapy, Chief of the Radiology Department of the Institute of Cancer, the University of Córdoba, Argentino. Translated by Tomas A. Hughes, M.D. With a Foreword by Richard H. Overholt, M.D. Cloth. Price, $10.75. Pp. 332, with 466 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Basil Blackwell & Mott, Ltd., 49 Broad St., Oxford, England; The Ryerson Press, 299 Queen St., Toronto 2B, 1949.

This book presents the results of many years of study of the bronchi and lungs by bronchography, for which the author has received many plaudits in Argentina and in this country. Beginning with the embryology and anatomy, the author presents his method of conducting the examination and a good discussion of the normal bronchial tree as shown by this method. He emphasizes the value of body section radiography in selected cases in addition to bronchography. Later chapters deal with pulmonary anomalies and with diseases of the lungs and bronchi. Extensive experience with Echinococcus cysts of the lung is described in one chapter.

Unfortunately, the translation leaves much to be desired. Some words are apparently transliterations from the Spanish. "Dynamism" is used to indicate the power of movement of the bronchi as well as the objective results of movement and the effect of respiration. "Foliage" is the term applied to the shadows of alveoli filled with opaque oil. Usually the meaning of the unfamiliar terms is clear, for example, when a bronchus is "repulsed" it is displaced, and when a bronchus is "strangulated" it is constricted. Occasionally the meaning of words or phrases is not clear. It is surprising that the manuscript was not edited in this country by someone familiar with English terms as used in medical writing. Nevertheless the author sets an excellent example in the care with which the examination is conducted and in the detailed analysis of bronchial shadows. Particularly good is his work with serial roentgenograms to show changes in caliber and movement of bronchi during short intervals of time. He believes this is of particular importance in the differentiation of early carcinoma of the lung from nonmalignant conditions and artefacts. The paper and the printing are excellent. The illustrations are beautifully reproduced and show that the author gets good films. The value of many of the illustrations would be greater with more complete legends, particularly with a clear statement of the disease being illustrated.

In spite of these shortcomings, this is a valuable book which will be studied with profit by those who are interested in diseases of the lungs and bronchi.

Sociology with Social Problems Applied to Nursing. By Sister Leo Marie Prober, O.P., B.A., Ph.D., Chairman of the Department of Sociology at Siena College, Memphis, Tenn., and Sister M. Eucharista Calvey, O.S.F., R.N., B.A., Dean of the College of Nursing, Niagara University, Niagara University, N. Y. Cloth. $4. Pp. 505, with 35 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C. 2, 1949.

This book proposes to present a "thoroughly collegiate course in sociology" with a special application to nursing situations. "It is hoped that this approach will meet the need, so long felt in the field of nursing, for collegiate sociology sufficiently thorough to prepare the nurse to understand the total social situation."

The first half of the book considers concepts of general sociology and the second half the sociologic integration in the field of nursing. The appendix gives a brief history of social thought and its development through Charles H. Cooley's teachings. The main theme throughout the book is the dignity of man, his intellect and will, which is an essential concept for all nurses. "Equal treatment for all, if carried out to the letter, is contrary not only to charity but also to justice, which demands that everyone should be treated according to his needs. The needs of all are not the same."

The first half of the book contains some excellent clear and concise definitions relating to basic concepts of society, social sciences, social processes and social change. Certain areas that merit consideration are: (1) the discussion on propaganda and the social responsibility of propagandists in a democratic society; (2) the sociologic discussion concerning racial and nationality groups with particular emphasis on the Negro in the United States, and (3) the modern American family, its disorganization

and reorganization. General sociologic interpretations are directed to the nurse.

In the second half of the book, in which the principles are applied to nursing, various social handicaps are discussed and usually one specific condition is elaborated on, for example, in the upper respiratory diseases the emphasis is placed on tuberculosis. Rehabilitation in chronic illnesses is discussed thoroughly. It would be necessary to define medical terminology for the young students in the preclinical area, if sociology were taught at that time.

The authors have used many resources for statistical data, basic concepts and controversial concepts of sociology. The book with its Catholic philosophy should be well accepted in all Catholic Schools of Nursing. It is an asset to any library for the benefit of clinical instructors in all fields of nursing in any school of nursing. It can be recommended for the use of instructors in nonsectarian schools as a reference text for applied sociologic principles in nursing when the traditional sociology is taught. Its brevity of some areas and clear definitions of sociologic concepts may be more beneficial to the nursing student than the usual academic course. This is one step toward having nursing texts of collegiate quality.

Community Sports and Athletics: Organization, Administration, Program. By National Recreation Association. Cloth. $1. Pp. 500, with 12 illustrations. A. S. Barnes & Company, 101 5th Ave., New York 3, 1949.

This is a guide book to assist local leaders in planning the community sports program. It discusses the objectives and purposes of a sports program as an essential part of community recreation and then outlines the development of principles and policies to achieve these aims. Methods of conducting activities, of classifying players, of developing eligibility standards, of operating leagues and tournaments and of holding meets and play days are explained in detail.

The place of leadership as the greatest single factor in a successful program is emphasized, and attention is given to personnel requirements for direction of the various types of activities. Duties and qualifications of executives, supervisors, instructors, facility managers and sports officials are discussed and outlined.

A series of record forms for the various sports, games and other activities are illustrated and methods of using them carefully described. Standards for facilities are fully explained, with stress on the need for adequate indoor and outdoor play areas as a requisite to a worth while program. A special section on program features describes a number of events that have proved popular in various communities and might be adaptable in many others. A complete bibliography and a list of organizations concerned with sports from which information can be obtained are useful appendixes.

The extreme practicality of the volume is refreshing. It suggests what should be done in a good program and then explains exactly how it can be done. While the book will, no doubt, be of greatest service to leaders in the field of community recreation, it will also be a useful reference for physicians serving on athletic commissions, recreation boards or other groups concerned with the administration of sports and athletics.

A Synopsis of Medicine. By Sir Henry Letheby Tidy, K.B.E., M.A., M.D., Extra Physician to H.M. The King, London. Ninth edition. Cloth. $7.50. Pp. 1243. Williams & Wilkins Company, Mt. Royal & Guilford Aves., Baltimore 2, 1949.

The popularity and usefulness of a book often is reflected in the number of editions through which the book goes. This synopsis of medicine is popular with students and with others who want information in capsule form. It is more of a handbook than a reference book but, nevertheless, contains a mass of material that, with its arrangement, has endeared the book to many. An occasional word may look a little strange to Americans (for example, "pappy foods"), but there is surprisingly little difference in the words that appear in this book and those in the usual American textbook. Perhaps this is due largely to the condensation of the material in the volume; there are few wasted words.

Clinical Instruction. By Amy Frances Brown, R.N., B.Ed., M.S. in N., Assistant Professor of Medical Nursing, State University of Iowa School of Nursing, Iowa City. Cloth. $3.50. Pp. 371, with illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C. 2, 1949.

This book presents a comprehensive picture of all phases of clinical instruction for nurses. The discussion of each phase starts with a clear statement of objectives which are derived from studies of society and students, and continues with a detailed exposition of different ways in which the objectives may be reached. The author is convinced "that clinical instruction may be most effectively directed by instructors who are free to devote most of their time to that function."

The breadth of her concept of clinical instruction is indicated by inclusion of a time study made under ideal conditions, which shows that 41 per cent of the nursing clinical instructor's time is spent directing nursing students in the care of patients and the many examples of real application of the principle of integration. Material on orientation to night experience and planning for senior experience is well developed. The unit which deals with evaluation includes a detailed description of means of evaluation of student experience and measurement of achievement and a guide to the evaluation of the instructional program.

References pertinent to particular points are placed as footnotes in addition to well selected reference lists at the end of each chapter. There is a wealth of illustrative material such as sample nursing care plans, suggestions for developing model nurse's notes and outlines for senior experience.

Although primarily intended for clinical instructors in the basic nursing program, this would be a valuable reference work for any member of the nursing school faculty or supervisor of nursing.

Theory of Hearing. By Ernest Glen Wever, Professor of Psychology, Princeton University, Princeton, N. J. Cloth. $6. Pp. 484, with 138 illustrations. John Wiley & Sons, Inc., 440 4th Ave., New York 16; Chapman & Hall, Ltd., 37-39 Essex St., Strand, London, W.C. 2, 1949.

It is fitting for an outstanding investigator of the past two decades to review the development of auditory theory from the earliest times and bring up to date an impartial presentation of all the classical theories. Wever has been in the forefront of the electrophysiologic investigation of the behavior of the ear and is, therefore, in an excellent position to evaluate the principal forms of the theories and bring them in line with modern facts. He has woven the past into the present in a most interesting pattern, the place and frequency theories. Previously held as separate principles of ear action, Wever shows how they may be adjusted and harmoniously reconciled to form a single complete theory of hearing. Even so, these have admissible uncertainties which should encourage future investigations. Those interested in physical acoustics, with its more recent expansion into the field of electronics and greater stress on the psychology of hearing, will find an excellent digest of important knowledge, together with the stimulating presentation of a painstaking worker in modern auditory research. The book is divided into three parts: Part I, the Classical Theories, relates the earliest groping speculations about the ear and the gradual rise of the anatomic knowledge out of which the theories of hearing were developed; Part II deals with Modern Developments of the Classical Theories, and Part III concerns itself in detail with the Volley Theory, the author having attempted to present the material in "plain language." A section containing a list of terms, abbreviations and symbols together with explanations will prove popular with readers who are unfamiliar with the technical language of this field.

Streptomycin: Nature and Practical Applications. Edited by Selman A. Waksman, Ph.D. Cloth. $10. Pp. 618, with 96 illustrations. Williams & Wilkins Company, Mt. Royal & Guilford Aves., Baltimore 2, 1949.

Information concerning the use of streptomycin accumulated rapidly. Several monographs have appeared that summarize the studies of streptomycin in various diseases. Keefer and Hewitt summarized the experience of physicians who reported their results to the National Research Council and presented the detailed analysis of the treatment in 3,000 cases of different

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infections. The National Tuberculosis Association has produced a monograph on the use of streptomycin in tuberculosis that sums up their experience extending over a period of several years. This monograph was edited by Dr. Selman A. Waksman, who wrote the historical introduction. The book is divided into four sections, including "Microbiological and Chemical Aspects," "Antibacterial and Pharmacologic Properties of Streptomycin," "Clinical Uses of Streptomycin" and "Miscellaneous Uses of Streptomycin." There is a good subject index at the end of the book.

The book is well planned, and the various topics are discussed by men who have had personal experience in the use of streptomycin. This monograph will be most valuable for all physicians. It can be recommended to anyone who wants to know about the present status of this remarkable antibiotic. There will be little change in results in the future, since the authors have documented their evidence well.

A Short Practice of Surgery. By Hamilton Bailey, F.R.C.S. (Eng.), F.A.C.S., F.I.C.S., Surgeon, Royal Northern Hospital, London, and R. J. McNeill Love, M.S., F.R.C.S., F.A.C.S., Surgeon, Royal Northern Hospital, London. With Pathological Illustrations by L. C. D. Hermitte, M.B., Ch.B., Pathologist, Royal Infirmary, Sheffield. Eighth edition. Cloth. $10. Pp. 1050, with 1198 illustrations. The Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; [H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C. 1], 1949.

This edition has been issued in five parts, appearing at interval of 2 or 3 months in an effort to keep it up to date and reduce the time lag of the appearance of the total volume to a minimum. The typography is excellent; no errors were found. The subheadings, paragraphing and clear type make reading easy.

Surgical topics are divided on a regional basis, and every subject is included from wound healing through genitourinary diseases to excision of the pancreas, fractures and diseases of bones and joints. There is an excellent index, and the subject matter is delivered with clarity and economy of expression. This book is reminiscent of the earlier editions of Rose and Carless so deservedly popular in the United States.

This small surgery manual, a *multum in parvo* to the harassed medical student and young surgeon, will prove to be a prized and often consulted possession.

Mental Hygiene in Public Health. By Paul V. Lemkau, M.D., Associate Professor of Public Health Administration and Director, Mental Hygiene Study, School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, Md. Cloth. Price, $4.50. Pp. 396, with 9 illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 18; Aldwych House, Aldwych, London, W.C. 2; Toronto, 1949.

The author attempts to trace the development of personality from the primordial germ plasm to death, illustrating at each stage of development the possibilities for modification of the individual in the direction of better mental health. Practical technics of mental hygience at the various age and developmental levels are described in detail. This book is one of the first attempts at a practical and realistic approach to discussion of mental hygiene in an over-all program of preventive medicine. Public health practices in relation to mental hygiene are discussed and the responsibilities of health officers for this phase of a public health program delineated.

This volume should be of value both as a reference work and a textbook in elementary schools and higher educational institutions. It should be of particular value to public health nurses and other public health workers to demonstrate how they, in their daily contacts, may foster better mental health.

Scientific Autobiography and Other Papers. By Max Planck. With a Memorial Address on Max Planck, by Max von Laue. Translated from German by Frank Gaynor. Cloth. $3.75. Pp. 192, with portrait. Philosophical Library, Inc., 15 E. 40th St., New York 16, 1949.

Translations into English of five of Planck's nontechnical essays constitute this book. The first essay, from which the volume takes it name, recounts the author's part in the development of relativity theory, quantum mechanics and nuclear physics. It sheds a most interesting light on the persons of this drama, from Helmholtz to Schrödinger. This information is admirably supplemented by the introduction, a memorial address delivered by Max von Laue after the death of Planck in 1947. The 90 years of his life included the two world wars, in each of which he lost a son; during the second war his house went up in flames, his library disappeared and he himself was buried in an air-raid shelter for several hours during the destruction of Kassel. Through all these vicissitudes, somehow, his scientific productiveness survived. The four remaining essays are entitled "Phantom Problems in Science," "The Meaning and Limits of Exact Science," "The Concept of Causality in Physics" and "Religion and Natural Science" and are of general philosophic interest.

Standards and Labels for Consumers' Goods. By Jessie V. Coles. Cloth. $5. Pp. 556, with 49 illustrations. The Ronald Press Co., 15 E. 26th St., New York 10, 1949.

The standards and labeling employed for consumers' goods are of intense interest to a large segment of the general population. In fact, many lecturers spend considerable time on this subject and help indoctrinate their audiences with an awareness of their respect for some of the measures that now are undertaken to develop and promote good products and to expose those that are questionable. This book in twenty-five chapters discusses the problems of consumers, labels on consumers' goods, some basic concepts of standards, how standards are obtained and used, grade labeling and the present status of standards and labels for consumers' goods. Included in the discussions are descriptions of the activities of the product-evaluating councils of the American Medical Association—the Council on Foods and Nutrition, the Council on Physical Medicine and Rehabilitation and the Council on Pharmacy and Chemistry. The book will be of more value to the lay person than to the physician, but the physician will find it a useful source of information to satisfy his own curiosity and to answer questions from his patients.

Bone and Joint Radiology. By Emerik Markovits, M.D. Cloth. $20. Pp. 446, with 616 illustrations. The Macmillan Company, 60 Fifth Avenue, New York 11, 1949.

This beautiful volume includes analytic and differential tables of the usual and newer problems of bone and joint diagnosis by the roentgen method. Some of the newer listings are on the bone changes incident to excessive vitamin feeding of infants and children, infarcts in bone and changes following chemical, physical and irradiation insults. The aseptic necroses, including the various osteochondritites, are neatly cataloged and discussed. Linear illustrations are used profusely. These facilitate making analytic interpretations, which are a distinction of the Vienna School of Radiology, which was forefathered by Holzknecht, Kienbock, Kreuzfuch, Haudek, Schwartz and others. The author, who is now with the Steiner Clinic in Atlanta, has drawn from numerous American roentgenographic sources to make this a superior 1949 edition.

Tuberculosis Nursing. By Jessie G. Eyre, S.R.N., B.T.A., Senior Sister Tutor, St. Helier Hospital, Carshalton, Surrey. Cloth. 21s. net. Pp. 291, with 103 illustrations. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C. 1, 1949.

In the simplest terms an English nurse writes a most useful book for nurses of the tuberculous. The special aspects of this type of nursing, as well as many procedures of general nursing, are discussed in some detail, so that even persons without nurses' training might be considerably instructed thereby. The book opens with 40 pages of elementary description of the disease. This opening is followed by adequate sections on ward management, including feeding, on drug and surgical treatments and on the care of special types of disease and complications.

Emotional Disorders of Children: A Case Book of Child Psychiatry. By Gerald H. J. Pearson, M.D., Director, Philadelphia Psychoanalytic Institute. Cloth. $5. Pp. 368. W. W. Norton & Company, Inc., 101 5th Ave., New York 3, 1949.

This book is an interesting and useful presentation of case histories of the emotional disorders of children from the psychoanalytic viewpoint. It is a reference book for physicians and is in no sense to be recommended to parents. It could be used as a reference book for medical students, but it is not organized along the lines of a textbook.

Psychological Medicine: A Short Introduction to Psychiatry, with an Appendix on Psychiatry Associated with War Conditions. By Desmond Curran, M.B., F.R.C.P., D.P.M., Psychiatrist and Lecturer in Psychological Medicine, St. George's Hospital, London, and the late Eric Guttmann, M.D., M.R.C.P. Foreword by Sir John J. Conybeare, M.C., D.M., F.R.C.P., Physician to Guy's Hospital, London. Third edition. Cloth. Price, $4. Pp. 252, with 20 illustrations. Williams & Wilkins Company, Mt. Royal & Guilford Aves., Baltimore 2, 1949.

This book on psychologic medicine, which is intended as an introduction to psychiatry, is intensely practical in its approach to the subject and stresses clearly the concept of psychiatry as an integral part of general medicine.

The authors accomplish a well rounded presentation of the more common clinical entities in a brief volume by means of an instructive preliminary discussion of etiology, general symptomatology, case history taking and the rationale of treatment methods. Subsequent chapters are devoted to specific subjects, e. g., schizophrenia, organic syndromes, affective reactions and some of the more common psychoneurotic reactions. The appendix deals with special problems of military psychiatry and their management.

That the entire material of this work is clearly set forth without resort to case histories is a tribute to the authors' skill and their broad knowledge in the field. There is a minimum of repetition and redundancy which so often characterize writings on such a subject. It is apparent that this book is the result of careful evaluation of large clinical experience, and the insertion of pertinent statistical data serves to protect the novice reader from the therapeutic overoptimism to which he may incline.

There is a notable paucity of historic background and psychologic theory on which much of present day dynamic psychiatry rests, but, considering the brevity of the book, this is understandable. This omission does not go without mention in the section on psychotherapy, wherein the divergence of schools of psychiatric thought are pointed out. References are basic ones, which should be useful as a guide for further study.

This book is recommended as an introduction to psychiatry and might serve well as a guide for the teaching of the fundamentals of the subject.

Roentgen-Ray Examination of the Digestive Tract. By Ross Golden, M.D., Professor of Radiology, The College of Physicians and Surgeons, Columbia University, New York. [Reprinted from Nelson's Loose-Leaf Diagnostic Roentgenology, with the Same Page Numbers as Are Used in That Text.] Cloth. $5. Pp. 265-350, with 117 illustrations. Thomas Nelson & Sons, 385 Madison Ave., New York 17; Parkside Works, Dalkeith Road, Edinburgh 9; 3 Henrietta St., London, W.C. 2, 1949.

The author of this book is to be congratulated on the comprehensive amount of material included in the discussion of the roentgen diagnosis of the esophagus, stomach, duodenum, small intestine, large intestine and gallbladder. It is a book that will be enjoyed by every radiologist and many clinicians. The author considers the roentgen diagnosis of various lesions and, in a masterful way, includes appropriate discussions of the anatomy and physiology of the various organs concerned, and in many instances the pathology of the lesions under consideration. No doubt there will not be complete agreement with all the statements made by the author.

If this book is to be reprinted again, several suggestions could be made to the author and the publishers: It is most unfortunate that the contents of this volume are not properly indexed. It is almost impossible to get any information from the book by referring to the index. If one wants to get the real value of this book, it is necessary to read it page by page. The double column of print is not as acceptable as the single column. Many of the illustrations are poor. Probably the caliber of the paper is not good enough for the type of illustrations that are used, and the illustrations are not up to the standards often seen in radiologic journals.

In spite of the above criticisms, this is an excellent volume and is highly recommended. The author is to be complimented on the legends for the illustrations. The histories that are included in these legends are of great value to the experienced radiologists and to the young radiologists.

Community under Stress: An Internment Camp Culture. By Elizabeth Head Vaughan. Cloth. Price, $2.50. Pp. 160, with 8 illustrations. Princeton University Press, Princeton, N. J., 1949.

This book is interesting not only for its content but because it is a manifestation of the scientific spirit of investigation which can rise above the frustration and the suffering of the concentration camp to make the experience itself into material for study observation and remarkably objective conclusions.

The book tells the story of a group of Americans captured and interned by the Japanese in the Philippine Islands. In addition to complete descriptions of their experiences, which are the more vivid for being controlled and unemotional, there are conclusions: Women adapted themselves better to the unfavorable situation than did men; Filipinos and others who had lived in the Philippines were better able to cope with the situation than others less familiar with Philipines conditions. Orientals found adjustment easier with regard to food, lack of privacy and anxieties about the future, while among occidentals the missionaries made better adjustment than lay groups and young men better than older men. Young children did better than adults, especially when housed with their mothers. An interesting comment on scientific observation in general was, ". . . an acutely realistic understanding of the effects of hunger upon personality was made possible by a personal sensation of hunger."

Childbirth: Your Questions Answered. By Carl Henry Davis, M.D., and Dorita Ferguson. Cloth. $2.50. Pp. 183, with illustrations. Harper & Brothers, 49 E. 33rd St., New York 16, 1949.

The contents of this book are presented in an informal style. The chapter sequence starts with "Preparation for Marriage" and continues in a reasonably logical manner. A question and answer style is used. The question is presented in italics, and a direct, straightforward application follows in a good type of print.

The first two chapters may be a little startling to some lay readers, but facts are facts. Occasional case histories are included.

In addition to the usual medical and lay information, there is a glossary of about 16 pages which should be helpful to the lay reader not familiar with medical terms. A six page index is also included. Pages 113 to 117 illustrate by drawings the process of birth.

The book is recommended to lay readers who want straightforward information and are willing to face facts. It should allay fears and reassure those who think. To the uninformed much information is made available.

The Doctor's Profession. Edited by Daniel T. Jenkins. Paper. 4s.6d. Pp. 129. Student Christian Movement Press, Ltd., 58 Bloomsbury St., London, W.C. 1, 1949.

This monograph is a result of a series of discussions held in London by a group of physicians and a theologian during the years 1945 to 1948. It is a stimulating and at times profound discussion of the relationship of the physician to society, the state and certain ethical and moral problems. It is particularly interesting now, when physicians have had to submit themselves to state control in England and are being subjected to the same political pressure here. For those with an interest in the broader aspects of medicine, this philosophic treatise is worth reading.

Introduction to Parasitology with Special Reference to the Parasites of Man. By Asa C. Chandler, M.S., Ph.D., Professor of Biology, Rice Institute, Houston, Texas. Eighth edition. Cloth. $6. Pp. 756, with 273 illustrations. John Wiley & Sons, Inc., 440 4th Ave., New York 16; Chapman & Hall, Ltd., 37-39 Essex St., Strand, London, W.C.2, 1949.

The new edition of "Introduction to Parasitology" has been rewritten entirely and constitutes a distinct improvement over the previous edition, which was excellent. More emphasis has been placed on the parasites of importance to man. The necessary basic information regarding nomenclature, classification and morphology is included but not overemphasized, which is consistent with a textbook of this type. The illustrations are well chosen and for the most part well done. For those interested in the subject, Chandler's textbook is recommended as an excellent choice.

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Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

"STUFFED UP" NOSTRILS AND VERTIGO

To the Editor:—A man aged 45 has had alternating nasal obstruction for several years. The left nostril gives him more trouble than the right one. When his left nostril becomes "stuffed up," the patient finds that lying on the right side will relieve the nasal obstruction. Lately, when the nasal obstruction becomes severe, there is some vertigo. Two years ago he had tinnitus in the left ear; the condition came on suddenly one night and lasted six months. When he is in dizzy objects about him seem to revolve in a clockwise direction. From the allergic standpoint, he was found to be free of reaction to any offending substances. He is married and is well adjusted to his environment. He had his tonsils and adenoids removed when he was 15 years of age. Wassermann test is negative. A kidney stone was recently removed. Several cauterizations of the turbinates did not alleviate the symptom. Nose drops are of transient value, and washing out the nasal passages with saline solution is helpful. There may be several days of relief, then suddenly his eyes burn and his nostrils become "plugged up." What is this condition?

M.D., New York.

ANSWER.—Facts given in this case suggest an allergic background despite the absence of positive skin tests. The history of a previous attack of tinnitus and vertigo and recent recurrence of the vertigo support this assumption, particularly in view of the fact that the early attack occurred at night. Another factor that may be contributing to the persisting, alternating obstruction is the use of nasal drops. Many persons react to local vasoconstrictors by more prolonged vasodilatation than existed previously. Also, some patients have a deviated septum which may be partially blocking one nasal passage, thus increasing the burden on the unobstructed side.

Temporary relief may be obtained from oral administration of ephedrine hydrochloride ½ grain (25 mg.) or phenylpropanolamine (propadrine®) hydrochloride ½ grain (25 mg.) three times a day provided the patient is free from hypertension or serious cardiac involvement. The popular antihistaminic agents may be given for a short time provided they do not cause drowsiness.

Specifically, the hypodermic administration of a high dilution of a commercial dust solution (1:1,000,000,000) in ascending doses every other day, progressing into the lower dilutions until relief is obtained, has been found to be effective as attested by Asley and his co-workers. Should the vertigo and tinnitus recur the patient may be treated with histamine injections. This may be given hypodermically as histamine phosphate beginning with 0.1 cc. and increasing the dose daily as tolerated up to 1 cc.

Sensitivity is denoted by immediate flushing and palpitation with local redness and swelling about the site of injection. Such symptoms call for a reduction in subsequent doses until the maximum dose that can be tolerated without reaction is reached. If the attacks of the vertigo and tinnitus are particularly severe, desensitization may be accomplished more rapidly by intravenous administration of 2.75 mg. of histamine phosphate in 250 cc. isotonic sodium chloride solution given at the rate of 15 to 30 minims (0.92 to 1.85 cc.) per minute.

DERMATITIS HERPETIFORMIS

To the Editor:—A 48 year old man has had dermatitis herpetiformis for many years. Many remedies have been tried. Fowler's (potassium arsenite) solution, 10 drops three times a day, gives complete relief from the lesions in about four days. When the medication is stopped, the lesions return. Is there anything else which might give relief? The patient cannot take the arsenic over long periods, because of side reactions which are as bad as the dermatitis. Has desensitizing with histamine been used in this condition?

M.D., California.

ANSWER.—Many drugs have been recommended for the treatment of dermatitis herpetiformis, but currently the drug most favored is sulfapyridine, 0.5 Gm. three times daily. Tripelennamine hydrochloride (pyribenzamine hydrochloride®) is sometimes effective, apparently because of its pyridene radical rather than for any antihistaminic action. The use of histamine for desensitization apparently has not been attempted. The most recently recommended drug is aureomycin. None of the remedies up to now have had any curative effect; they merely control the disease.

FRACTURE OF THE HAMATE BONE

To the Editor:—How are fractures of the os hamatum treated? What are the chances of the development of an aseptic necrosis of the bone?

William R. Bunge, M.D., Laurel, Md.

ANSWER.—Fractures of the hamate bone are rare and occur usually from direct violence, most often crushing wounds of the wrist, and as such are associated with extensive swelling and soft tissue injury. The associated injuries may mask the presence of hamate fracture, especially since the fracture line may not show in roentgenograms unless many views are taken. The fracture may involve the body of the bone or the hook or both, often with comminution but seldom with much displacement because of the ligamentous attachments. Fracture of the base of the fifth metacarpal may be associated. If the hook is dislocated it may interfere with the action of the flexor tendons to the fourth and fifth fingers.

The condition should be suspected if pain and tenderness are present over the ulnar side of the wrist, particularly on pressure over the palm at the base of the third and fourth metacarpals, and over the dorsum at the base of the metacarpals between the extensor digiti quinti proprius and the common extensor to the fifth finger. There tends to be flattening of the hypothenar eminence, and the patient complains of pain when the hand is held flat on the table as in writing.

The early treatment is often determined by the associated injuries. The fracture may usually be reduced by pressure and molding followed by bringing the wrist into a moderate extension and slight ulnar deviation. It is held in this position in a plaster cast from the heads of the metacarpals to the middle of the forearm. Immobilization should be maintained four to six weeks. Those who have reported on this injury generally are agreed that after this period of immobilization patients are usually able to return to work. Operative intervention is probably unwise; certainly removal of the bone would not seem indicated. There have been no recorded instances of aspetic necrosis.

STERILIZATION OF AIR IN WAITING ROOM

To the Editor:—Please describe an effective method of sterilization of the air in my waiting room to prevent transmission of respiratory infection.

Helen Newmark, M.D., Springfield, Mass.

ANSWER.—"Studies in Air Hygiene" (Bourdillon, R. B., and others: Studies in Air Hygiene, Medical Research Council, Special Report Series, no. 262, London, His Majesty's Stationery Office, 1948) represents the most comprehensive investigation of this subject ever undertaken. The advantages of different methods of air disinfection reviewed in these studies included:

1. Daylight and sunlight lower the mean content of airborne and dust-borne bacteria.

2. Natural ventilation is an admirable means of air disinfection when practicable.

3. Mechanical ventilation is reliable when properly installed and operated. In general, not less than four air changes per hour are advisable.

4. Recirculation of air through cleaning plants has a definite value when the cleaning system is efficient and the output adequate to give at least four air changes per hour.

5. Ultraviolet radiation has potential value provided it is correctly installed and is regarded as a method of dealing chiefly with fine particles and not as a complete procedure for keeping clean the air of occupied rooms. With screened lamps placed 7 to 8 feet (216 to 244 cm.) above the floor, attention must also be paid to the vertical circulation of air in the room. In rooms not occupied while the lamps are lit or in the ducts of recirculation plants much higher intensities of ultraviolet radiation are practicable. Since ultraviolet radiation is relatively ineffective against dust-borne organisms, it is desirable to combine its use with some method of dust control.

6. Chemical disinfection of air is less effective on the larger dust-borne particles than on fine particles. Most chemical methods need some daily or weekly attention and are apt to become unsatisfactory if neglected. There is a wide choice of chemicals and means of dispersal; each appears to have merits for different situations. The maintenance of effective concentrations of chemical disinfectants is complicated by the degree of antibacterial action desired (killing or attenuation), the instability of some chemical agents in the presence of air and dust, and the toxic or irritant properties of the agents.

7. Sterilization by heat is considered the most effective method for complete sterilization of air provided the volume of

air is not excessive; air heated for a brief period (one second) to 300 to 350 C. during passage through a furnace is sterile.

8. Electrostatic precipitation, applied in conjunction with a mechanical ventilation or recirculation system, is efficient with all sizes of particles but is subject to the limitations of those systems.

9. Dust control is an important factor in air hygiene. Coating of floors with a dust-laying compound, oiling of textile materials during laundering and avoidance of sweeping with a dry brush are procedures which are efficient in dust control.

10. The use of masks for the prevention of air pollution and for the protection of individuals, while not strictly a means of air disinfection, deserves more attention than it ordinarily receives.

TUMOR OF THE MALE BREAST

To the Editor:—Six weeks ago a well nourished, white man, 52 years old, complained of a slightly tender mass present for ten days deep in the right nipple. Ten days later the soft, still slightly tender mass was perceptibly larger and about the size and shape of a mushroom top, 3 cm. in diameter. The testicles, prostate, thyroid and lymph nodes were normal. There was no history of alcoholism, nor were there symptoms of hepatic or gastrointestinal disturbances. The diet has been good, and there has been no weight loss. The results of fluoroscopic examination of the lungs, sedimentation rate, temperature and red and white blood cell counts were normal, as was the structure of the cells. Facilities are not available for hormone assays or tests of hepatic function. Three or four days after the second examination, another doctor removed "a small mass of fat" through a 3 inch (8 cm.) incision lateral to the right nipple, which structure remains intact. No histologic study of the tissue specimen was made. There has been no hypertrophy of the other breast to date. What would have been the original treatment of choice? What is the possibility of malignant change in the right breast? If the patient should begin to worry about cancer and come under my care again within the next month or so, what would be the proper course of treatment?

Harry J. Weber, M.D., Chaman, Pakistan.

ANSWER.—Although carcinoma of the male breast is relatively rare, it occurs sufficiently often so that one should be suspicious of any abnormality in this region. Since amputation of the male breast is a simple and safe procedure, it should be done so that histologic examination may be carried out in any condition in which simple excision biopsy of the suspicious area is not expedient. Obviously there may be some individual variation in following such a procedure in every case, but the possibility of malignancy even in the male breast is so great that the responsibility of establishing a correct diagnosis as rapidly as possible rests on the physician who first sees the patient and, as this can be done only by histologic examination; adequate biopsy or simple amputation is mandatory in all cases.

ORAL APHTHAE

To the Editor:—A woman aged 34 has had superficial burning ulcers along the margins of the tongue, lips and palatine pillars almost continuously for three and one-half years, worse at menses. Objective observations otherwise are normal. Treatment with vaccines, bacterially induced fevers, vitamin B complex, nicotinamide, riboflavin and bismuth preparations has been without benefit. She obtained some improvement temporarily when she took penicillin troches. I prescribed aureomycin troches, and the lesions cleared almost immediately but returned before the period of medication was finished. In her case the nervous element seems minimal. Please advise.

R. S. Hamilton, M.D., Chateau, Mont.

ANSWER.—The probable diagnosis would seem to be oral aphthae, which along with canker sores, herpes simplex and herpetic stomatitis, are considered to be manifestations of the herpes simplex virus. The age, sex, location of the lesions and duration and recurrence of the condition are all characteristic. They often are more notable at menses. The failure of therapy is typical, and the transient effect of the antibiotics could have been due to a clearance of secondary infection, although aureomycin has been said to affect herpetic lesions in a few cases. Other causes which involve the gums or localized areas near repaired teeth or which are manifested by acute severe symptoms seem to be excluded by the history. It is presumed that the white blood cell count is normal. An allergic cause is not probable, although stomatitis medicamentosa (with a fixed oral drug eruption) and stomatitis venenata (with a contact of drugs to sensitized mouth tissues) should be ruled out. The most useful therapy, in addition to an adequate food and vitamin intake and a clean mouth, is a repeated vaccination with smallpox vaccine, as described before in this column. Six to eight vaccinations at intervals of ten days, and without regard to "takes," is the usual procedure.

It is suggested that previous information in these columns (notably on Sept. 24, and Oct. 1, 1949, and on July 20, 1949, June 12 and Feb. 7, 1948) as well as comments on the answers (on Dec. 24 and Dec. 31, 1949, and on July 10 and Dec. 25, 1948) be read in order that other aspects and views of the condition be understood.

SYMPATHETIC UVEITIS

To the Editor:—A man 35 years of age injured his left eye in April 1948, when a chip of metal pierced the globe and embedded itself in the optic nerve head. Attempts at extraction of the foreign body failed. Removal of the eye was advised, but permission was not obtained. On May 18 he complained of a floater in front of his right eye, and on May 23 he said he could see four floaters. No abnormality was discovered with the ophthalmoscope. An enucleation was done. Vision in his right eye was now 6/5. On June 21 he complained of dimness of vision. The vision was 6/6, and there was blurring of the optic disk and a haziness of the vitreous. The condition was diagnosed as sympathetic ophthalmia. The vision has gradually deteriorated. Treatment has included repeated injections to promote fever, e. g., triple vaccine, pyrifer (a mixture of nonpathogenic bacteria), mercury inunction, streptomycin locally and intramuscularly, sulfadiazine in repeated courses and penicillin locally and intramuscularly and subconjunctivally. He has also had a prolonged course of large doses of sodium bicarbonate and potassium iodide as well as diphenhydramine hydrochloride; prophenpyridamine and antistine® (2-phenylbenzylaminomethyl-imidazoline) locally and by mouth. Vision on July 28, 1949 was 6/36. There were numerous cells in the anterior chamber and in the posterior space. There was no keratitis punctata. The vitreous appears fluid. The fundus can be seen only indistinctly. The pupil is well dilated with scopolamine. Tension is normal. I would be glad of any advice that you could give me.

O. M. Hoarburger, M.D., Cape Town, Union of South Africa.

ANSWER.—This probably is sympathetic uveitis, although the diagnosis is "always only a probable one at best." No one can look at just the sympathizing eye and say that the trouble came from an injured eye, and in many instances there is nothing about this uveitis which is different from that from causes such as tuberculosis, syphilis or infected teeth or tonsils. Ridges, folds and furrows, radial in general course, with newly formed blood vessels running across them, give the most diagnostic picture, but tuberculosis and syphilis duplicate it at times. No known special treatment is of any avail, but many patients with a 6/36 reading or less retain this vision or even have better vision in time.

INTESTINAL WORMS

To the Editor:—On a vacation in Canada I stayed at a farm house far from any doctor. The girl in the family asked me what could be done about her worms. She said she had passed intestinal worms for years and I saw worms in fresh stools three times. They were about ½ inch (1.3 cm.) or ⅔ inch (1.6 cm.) long, actively motile and about ⅛ inch (0.3 cm.) wide with rounded ends. The girl appeared undernourished. The worms seemed too broad for pinworms, and I thought that hookworms did not occur in cold places like Canada. Please give me your opinion of the diagnosis. Would you advise giving tetrachlorocthylene; if so, what is the dosage and method of administration?

M.D., Massachusetts.

ANSWER.—The description of the worms is not adequate for diagnosis, since they do not resemble the description of any of the enteric roundworms that might be found in the region. Since the worms are described as relatively broad with blunt ends, individual motile proglottids of Taenia saginata were possibly seen in the feces. The gravid segments of this tapeworm are often passed singly and may even force their way through the anal sphincter. When first passed they may be extremely active and may assume a variety of shapes. As in the present instance, the patient is often aware of harboring the parasites, whereas the small enteric roundworms are usually passed without the knowledge of the host. Any advice concerning therapy necessarily depends on exact diagnosis. If on further examination the "worms" prove to be Taenia proglottids, treatment with aspidium oleoresin is advised.

BACILLUS PYOCYANEUS INFECTION OF MIDDLE EAR

To the Editor:—I would appreciate information on the treatment of chronic infection of the middle ear with Bacillus pyocyaneus.

M.D., Virginia.

ANSWER.—Infection of the middle ear with Bacillus pyocyaneus represents a secondary invasion from the external canal. This infecting agent is usually found in the nondangerous types of middle ear disease, although not invariably so. The pathologic condition which predisposes to such an infection usually is located in the eustachian tube and the peritubal cells, with a perforated or destroyed ear drum acting as a portal of entry for secondary invaders. The first principle of treatment is to keep the ear as dry and clean as possible. The use of hydrogen peroxide followed by alcohol with capillary suction to clean the ear is helpful.

Insufflation of a small amount of powder has sometimes helped to keep the ear dry when there is a large perforation or destroyed membrana propria. Infection in the nasopharynx or obstruction

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of the tube by hypertrophied lymphoid tissue at the pharyngeal opening should be corrected. Streptomycin solution has sometimes been of value in clearing a specific infection and should be considered in infection with B. pyocyaneus. The use of an antihistaminic drug, such as tripelennamine hydrochloride, sometimes helps reduce the mucoid discharge and aids in keeping the ear dry. The general state of nutrition and climatic conditions are also sometimes influential factors. Mastoid surgery is seldom indicated in such cases, but any polyp or granulations should be removed or destroyed.

RECURRENT ULCERS OF LABIA

To the Editor:—A girl aged 16 complains of periodic ulceration of the labia for the past six years. The ulcerations were mild at first, being only ¼ inch (0.64 cm.) in diameter and not deep; however, they are more extensive and at present there are six or seven ulcerated areas, one of them being about ¾ inch (2 cm.) long, ½ inch (1.3 cm.) wide, and ⅛ inch (0.32 cm.) deep, a crater-like ulceration. The patient has been treated by numerous doctors, dermatologists and general practitioners. She has been given local applications, toxics and autohemotherapy in the form of 30 cc. of blood from a patient who had recovered from herpes zoster. The latter treatment has given the most satisfying results. The worst attack that she has ever had is in progress now. She was given smallpox vaccine, which resulted in the first take that she had ever had although she had been vaccinated several times. It is assumed that possibly the smallpox vaccine has stirred up the ulceration on her labia. These ulcerations involve some of the vaginal mucosa also and she has one lesion bordering on the rectal mucosa. Numerous cultures, direct stains and blood, urine and other tests have been made with no positive findings. Aureomycin and chloramphenicol have been used with only temporary or minor relief. Please suggest treatment.

I. N. Kraushaar, M.D., La Habra, Calif.

ANSWER.—The description strongly suggests ulcus vulvae acutum, a condition that is not fully defined. Most textbooks refer to it as an infection due to Bacillus crassus, ordinarily considered to be a saprophyte. It responds readily to treatment with mild antiseptics, but it is prone to recur. Wien and Perlstein (J. A. M. A. **98**: 461 [Feb. 6] 1932) reported a case in which the cause was determined by psychoanalysis. Such factors as emotional trauma from the first menstrual period, masturbation equivalents and tension state seemed to play a causative role, and appropriate psychotherapy effected a cure. It might be well to investigate this case along such lines.

PROCAINE PENICILLIN AND SULFADIAZINE

To the Editor:—Is the action of sulfadiazine inhibited by procaine penicillin when the two drugs are administered concurrently? Are data available on the blood levels in infants and children, as compared with blood levels in adults, obtained by administration of procaine penicillin in oil with two per cent aluminum monostearate?

Frank A. Stewart, M.D., Newport, R. I.

ANSWER.—It is unlikely that the amount of procaine present in procaine penicillin would interfere with the action of sulfadiazine when sulfadiazine is administered in therapeutically effective amounts. In fact, it is common practice to administer sulfadiazine and procaine penicillin simultaneously. Emery and his colleagues (*Brit. M. J.* **2**: 1110 [June 25] 1949) have published data on penicillin blood levels following administration to children of procaine penicillin in oil with 2 per cent monostearate. Sixty-six children received varying doses of the preparation. Children under 1 year of age received 75,000 units; children 1 to 4 years of age received 150,000 units, and children over 4 years of age received 300,000 units. The average blood level at the end of the first hour was 0.2 units per cubic centimeter. In 65 out of 66 children, levels of 0.06 units per cubic centimeter were maintained for at least forty-eight hours. Daily injections produced higher levels than the alternate daily injections. They concluded that the preparation is suitable for use in children.

PSEUDOCELLULITIS

To the Editor:—I have a patient with indurated skin following penicillin injection. The skin became red, burning and itchy after the injection and now, four weeks after, is indurated. Is there anything to combat this?

J. Kimber Lovan, M.D., Mt. Holly Springs, Pa.

ANSWER.—The induration in this case may be an example of pseudocellulitis, discussed by Lesnik and his co-workers (*Surgery* **24**: 989 [Dec.] 1948; abstracted in J. A. M. A. **140**: 128 [May 7] 1949). They interpret the induration as a localized allergic reaction to penicillin in oil and beeswax and treat it accordingly with cool wet packs and antihistaminic preparations. It disappears in time. The induration of true infectious cellulitis is treated with absolute rest of the part and the application to it of heat.

DEPIGMENTATION AND ALOPECIA

To the Editor:—A patient was mixing dry cement with water and gravel to complete a concrete slab. In the process, gloves protected the hands. After he had completed the job, he rinsed his hands with water and, while his hands were still wet, stroked his hair several times. One week later a loss of pigmentation occurred on the extensor surface of his arm and dorsal surface of his hands. His scalp showed patchy areas of alopecia. Some gray hairs appeared on the head. I saw this man four months following this episode. None of the pigmentation or hair had returned. Can you tell me something about the agent which caused the burn and whether any return of pigmentation or hair can be expected?

M.D., Texas.

ANSWER.—The alkali content of portland cement is capable of inducing dermatitis, usually characterized by ulceration. This cement is not known to produce depigmentation and especially not in the absence of dermatitis. The mere stroking of hair with a wet rinsed hand is most unlikely to lead to alopecia. In tanneries, strong alkalies are employed for depilation, but the exposure described appears to be far too trivial to have provoked hair loss or hair graying. Mention is made of the wearing of gloves. If the gloves were rubber and if they contained mono-benzyl-ether of hydroquinone as an antoxidant, prolonged exposure would produce depigmentation. If so, return of pigment may be expected in three or four months. The type of alopecia described sometimes is of neurogenic origin, but the precise mechanism is unknown. At times hair growth is resumed with or without treatment.

LUMP IN BREAST OF YOUNG WOMAN

To the Editor:—An unmarried girl, age 20, consulted me regarding a lump in the right breast, which she had noticed about two months previously; it is not getting any larger. The left breast is normal. The breasts are normal in appearance, and the right one does not look different than the left. The lump is hard, about 3 inches (8 cm.) in diameter in all directions, is freely movable, not tender, lies close to the nipple surface, has a "disk shape" and is not over 1 inch (2.5 cm.) in depth. The center of the mass is beneath the nipple. Should biopsy be done, or may hormonal therapy be tried for a time to see whether the lump gets smaller. If so, what therapy should be tried, and what is the most likely diagnosis?

M.D., Wisconsin.

ANSWER.—From the history given the most probable diagnosis in this case would be chronic mastitis or fibroadenoma of the breast. However, it is impossible for anyone to diagnose correctly without utilizing such diagnostic aids as roentgenograms, transillumination, palpation, location of the lesion and biopsy. Such a lesion could be malignant in a girl of this age or younger. It is more judicious at the time of biopsy to remove the entire lesion rather than a small area, because the lesion might be malignant and, if disturbed, some of the cells might find their way into the vessels or lymphatics. If the lesion is benign, it is also better removed.

VITAMIN C

To the Editor:—Does dilution of orange juice in hot water effect the potency of vitamin C in the orange juice?

Leslie H. Haggard, M.D., Limestone, Maine.

ANSWER.—Vitamin C is readily oxidized, and when exposed to air it is destroyed rapidly. Heating in the presence of air seems to hasten this destruction. Experiments carried out with tomato juice show that after 30 minutes at 60 C., 17 per cent of the vitamin C is destroyed; 27 per cent of the vitamin is destroyed after 30 minutes at 80 C. and 23 per cent after 30 minutes at 100 C. (Sherman, H. C.: Chemistry of Foods and Nutrition, ed. 7, New York, The Macmillan Company, 1946, p. 342.) It seems unlikely that a significant amount of vitamin C would be lost if orange juice is diluted with hot water and taken immediately. If it stands for any length of time, however, there would be an appreciable loss.

CHLOASMA UTERINUM

To the Editor:—A patient has liver spots or pigmentation of the skin of the face due to pregnancy. Her baby is several years old now. Can the pigmentation be eradicated?

Wallace D. English, M.D., Cardwell, Mo.

ANSWER.—In general the results from treatment of chloasma uterinum are unsatisfactory, although slight improvement can sometimes be attained by the application of peeling or bleaching preparations, such as fresh hydrogen peroxide in a water-soluble or emulsifying base. Some physicians favor the use of a cold quartz lamp, but the treatment must be administered carefully and with persistence.

PARADOXIC GLYCOSURIA

To the Editor:—In the October 1948 issue of *The American Journal of Medicine* Dr. Wilder states that insulin mixtures are more economical than protamine zinc insulin alone when the requirements are great. However, he refers to Bowcock's "paradoxical glycosuria," quoting the latter as saying that hypoglycemia trips a mechanism releasing sugar from the liver and the amount thus released exceeds what can be utilized immediately. This is used as an argument against the use of protamine zinc insulin alone in large doses. My co-workers and I have a group of poor and unwilling ignorant patients, and our policy has been to use protamine zinc insulin solely. We try to get a fasting blood sugar of 150 mg. or less per hundred cubic centimeters with minimal if any twenty-four hour sugar loss in the urine. Occasionally a patient may complain of symptoms such as dizziness. Are there any "paradoxic" cases in our group? Even though we have fasting blood sugars, does Wilder imply that the 2 or 3 a. m. blood sugar level can be significantly and dangerously lower than the ordinary fasting blood sugar of 6 a. m.?

S. Richard Horie, M.D., Honolulu, Hawaii.

ANSWER.—The statement that "occasionally a patient may complain of symptoms such as dizziness" suggests that the amount of insulin necessary to hold the fasting blood sugar at 150 mg. per hundred cubic centimeters or less has been excessive. The blood sugar level at 2 or 3 a. m. may well be hypoglycemic, even though the fasting blood sugar is up to 150 mg. per hundred cubic centimeters. This is the paradoxic reaction.

POSTENCEPHALITIC PARKINSONISM

To the Editor:—Kindly let me know if there have been any recent suggestions about the treatment of oculogyric crises of postencephalic Parkinsonism?

H. B. Eisenstadt, M.D., Port Arthur, Texas.

ANSWER.—Nothing of proved value has appeared for the prevention or relief of the oculogyric crises seen in postencephalitic parkinsonism. The newer synthetic antispasmodic agents (tribexyphenidyl artane® or caramiphen hydrochloride [panparnit,® formerly parpanit]), as well as the well-known belladonna compounds and amphetamine sulfate occasionally may appear to decrease the frequency and severity of attacks, but whether this apparent benefit is real remains to be established. Some patients appear to obtain benefit from the barbiturates and claim that the duration of a seizure may be decreased if one of these substances is taken at the beginning of an attack. Surgical measures are not of value.

SPIDER BITE

To the Editor:—A boy aged 16, who was bitten on the buttocks by a black widow spider, continues to suffer from spasms of his leg, thigh and recti muscles. Calcium gluconate, purified chondodendron tomentosum extract (intocostrin®), heat and opiates all give temporary relief. Is there anything else one might use? Would tribromoethanol solution (avertin®) be recommended during the acute phase of abdominal rigidity? Is the antivenom of any value?

Lloyd L. Downing, M.D., Winters, Texas.

ANSWER.—Persistent paresthesias, with tingling and spasms of the large muscle, have been observed in a number of cases following the bite of Latrodectus mactans but usually subside without special treatment. Treatment with specific antivenin or calcium gluconate is of value early, when the venom is still present. Later residual symptoms are secondary to the severe muscle spasm during the acute stage and are best relieved by hydrotherapy, heat and massage.

THE GRAYING OF HAIR

To the Editor:—Borland's American Illustrated Medical Dictionary (ed. 21) states that "antiamitic" is something that is opposed to the graying of hair. I have read in reliable sources that there is no such agent.

Foster M. Sanger, M.D., Oklahoma City, Okla.

ANSWER.—Some time ago it was suggested that both pantothenic acid and para-aminobenzoic acid might prove to be anticanitic agents because they seemingly prevented the graying of hair in laboratory rats, but they have had no such effect on humans. An agent which will prevent the graying of hair is as yet unknown.

ANTIBIOTICS FOR DENTAL INFECTIONS

To the Editor:—Do you know of any reports of treatment of root infection of the teeth with new antibiotics such as aureomycin or penicillin?

M.D., Montana.

ANSWER.—Dr. Louis Grossman of the University of Pennsylvania Dental School has reported successful results in treating root end infections with a combination of penicillin and streptomycin in peanut oil (The Effect of Penicillin and Streptomycin in Endodontia, *J. Oral Surg., Oral Med. & Oral Path.* **2**: 3 [March 19] 1949).

KNOOP TEST FOR PREGNANCY

To the Editor:—I should like to know how the Knoop test for pregnancy compares with the Aschheim-Zondek and Friedman tests. It has been recommended to me as a simple and reliable office test for pregnancy.

L. P. Hetherington, M.D., Miami, Okla.

ANSWER.—The Knoop test (*Beitr. z. Chem. Physiol. u. Path.* **7**: 356, 1908) is based on the detection of histidine. An extensive paper on this test was written by R. Kapeller-Adler and F. Haas in *Biochemische-Ztschrift* (**280**: 232, 1935). W. R. Ricketts, R. C. Carson and R. R. Saeks (*Am. J. Obst. & Gynec.* **56**: 955, 1948) used this test in more than 400 cases and concluded that it is sufficiently rapid, simple and accurate to justify its use, particularly as an office procedure. These authors detected an accuracy of 95.1 per cent in clinically positive cases and 92.6 per cent in clinically negative cases. They compare this with an accuracy of 94 and 97 per cent for the Aschheim-Zondek and Friedman tests, respectively.

TRANSMISSION OF DISEASE

To the Editor:—What diseases are transmitted by the open toilet?

M. C. Sheppard, M.D., Denton, Texas.

ANSWER.—If "open toilet" is construed to be the unsanitary, open back, surface privy which allows deposition of excreta directly on the soil, there are a number of communicable diseases which are disseminated by the excreta of patients and "carriers." Among them are typhoid, paratyphoid, cholera, shigellosis, salmonellosis and infectious hepatitis, and a number of parasitic diseases, such as ascariasis, amebiasis and ancylostomiasis. If the term "open toilet" refers only to the open portion of the toilet, such as the seat, privy riser or flush commode, epidemiologists doubt whether any disease is actually transmitted from these surfaces. Certainly venereal diseases may be ruled out. Conclusive evidence appears to be lacking with respect to such transmission of conditions as pediculosis (crab lice) and vulvovaginitis in small children.

SPIDER NEVI IN WOMEN

To the Editor:—I have been informed that spider nevi in women with cirrhosis of the liver are rare. Is this correct? What is the explanation of the phenomenon of spider nevi?

M.D., New York.

ANSWER.—Cutaneous arterial spiders occur in various conditions; their relation to hepatic disease has been known for about eighty years, but they occur also in pregnancy, in deficiencies of the vitamin B complex and in normal persons. The hypothesis has been advanced that an increase or qualitative change in circulating estrogens is the cause of this vascular disturbance because the liver fails in keeping the 17-ketosteroids in balance. One should remember gynecomastia in cirrhosis of the liver in this connection. Vascular spiders together with palmar erythema definitely appear in women.

References:

Patek, A. M., Jr., and others: The Vascular "Spider" Associated with Cirrhosis of the Liver, Am. J. Med. Sc. **200**: 341, 1940.

Bean, W. B.: The Cutaneous Arterial Spider: A Survey, Medicine **24**: 243, 1945.

SHINGLES AND POLIOMYELITIS

To the Editor:—A boy aged 10 years has severe shingles. Could serum from the herpetic lesions be used to vaccinate against anterior poliomyelitis? Have any patients with poliomyelitis ever been afflicted previously with herpes zoster?

G. F. Bergmann, M.D., Mattituck, N. Y.

ANSWER.—Information regarding relationship between shingles and poliomyelitis is not available. It is doubtful whether serum from a lesion of herpes zoster could be employed as vaccination against poliomyelitis, inasmuch as this virus is antigenically similar to that of chickenpox. A study of the relationship between herpes simplex virus and poliomyelitis virus revealed that high potency herpes simplex antiserum did not inactivate the Lansing strain of poliomyelitis virus.

THYROID ADENOMA AND PREGNANCY

To the Editor:—Is there any contraindication to the removal of a small nontoxic thyroid adenoma during early pregnancy in a Negress woman aged 28?

M.D., California.

ANSWER.—Unless there is more specific indication than that given in the query, it probably would be best to wait until the pregnancy is terminated. The pregnancy is not likely to make the adenoma worse, but surgical trauma to the thyroid could cause abortion.